THE LATE RESULTS OF RADIUM TREATMENT FOR UTERINE HEMORRHAGE OF BENIGN ORIGIN

GERRY R. HOLDEN, M. D.

Jacksonville

THIS paper is based upon a study of 220 cases of uterine hemorrhage of benign origin, which, during a period of 13½ years, were given intrauterine treatment with radium. The first case in the series was treated on Sept. 27, 1920, and the last on Feb. 28, 1934.

The ages of these patients ranged from 25 to 65 years, but nearly 80 per cent of them were over 40. The average age was 45½ years. Ninety per cent of the 210 married women had borne children. As all were private patients, the white race is predominant, with only three negroes included.

In this series are included three types of uterine hemorrhage. Group 1 consists of 9 young women with no gross abnormality in the pelvic organs; these patients were given light radiation with the intent that, after a period of temporary amenorrhea, the menstrual periods become re-established normally. Group 2 comprises 44 patients in whom the hemorrhage was associated with myomatous uteri. The remaining 167 patients had no gross lesions other than subinvolution and relaxation of the musculature of the fundus with, in some instances, varying degrees of uterine malposition due to relaxed vaginal outlets.

Uterine hemorrhage was the predominating symptom in each case; either menorrhagia or metrorrhagia, or both. In each case a diagnostic curetment was done before treatment. No abnormalities other than hypertrophy of the endometrium and dilation of the glands were found in any of them. There were few complications of

any moment occurring during the course of any of these treatments. Pelvic pain, varying in amount, was present in the majority of cases. In only three cases was it so severe that the radium had to be removed before the appointed time. In another case the radium was removed when an unrecognized chronic malarial infection gave rise to a chill about twelve hours after treatment was instituted. In a fifth case, a chronic salpingitis, overlooked in the preliminary examination, necessitated the premature removal of the radium. This patient ran a typical course of recurrent acute salpingitis which ultimately subsided and hemorrhages did not recur.

In the majority of cases treatments were carried out under an anesthetic. After the preliminary curetment, a preparation of radium sulphate, so screened as to cut out all but the gamma rays, was introduced into the fundus of the uterus. This was removed after sufficient time had elapsed to give the required dosage. The amount of radium used, measured in terms of radium element, varied from 25 mg. to 120 mg. The amount of radiation, varying with the requirements of the individual case, ran from 250 mg. hours in some of the cases in the first group to 5 Gm. hours in some of the myoma cases. In nine cases it was necessary to repeat the treatment at intervals varying from six months to a year after the initial treatment. Seven of these cases were myomatous; the other two, uncomplicated subinvolution.

In order to ascertain the ultimate effect of treatment, I have tried to learn the present condition of all these patients. Of the 220 cases, 186 have been traced.

No case is included in which the interval between treatment and report is less than two years: in general, I believe that the condition of the patient after two years represents the final results. Certainly in this series, I have observed no recurrence of hemorrhage due to conditions present at the original treatment after two years of amenorrhea.

Seventeen of these patients have died since treatment, seven within the first two years. Thirteen of these deaths were from medical conditions in no wise connected with the pelvic organs. The other four patients died of various gynecologic conditions. Two of them, in whom the conditions causing death developed several years after treatment, merit further consideration, as their histories are of some importance in estimating the value of this procedure.

CASE 59. 1924, Mrs. M., aged 60, was in good health for seven years after treatment. Carcinoma of the cervix then developed and she died.

CASE 81. 1926, Mrs. G., aged 40, had no recurrence of bleeding, but about six years later carcinoma of an ovary developed and caused death.

Had these patients been treated by operation instead of radiation, there is a possibility, contingent upon the type of operation performed, that the later developments would never have occurred. However, the fatal lesions were not present at the time of treatment and it hardly seems justifiable to use major surgery as a prophylactic measure. Moreover, the present day gynecologist lacks the omniscience to foresee in just which patient cancer is going to develop in later years and to select the operative procedure that will prevent it. Hence, I do not feel that the value of the treatment is impaired by the late developments in these two cases. The other two patients dying of gynecologic conditions will be considered later, in the list of unsuccessful cases.

The time elapsed in these cases between treatment and the final report, as well as the results of the treatment, is shown in the following table. In estimating the results of treatment, the effects of radiation upon the uterine hemorrhage only are considered. In the first group, the criterion is whether the menses were reestablished normally after a period of temporary amenorrhea; in all other cases, whether a permanent amenorrhea resulted.

Year of treatment	Cases traced	Died within two years	Treatment successful	Treatment unsuccessful
1920-21	8	1	6	1
1921-22	9	0	7	2
1922-23	7	0	7	0
1923-24	9	0	9	0
1924-25	8	1	7	0
1925-26	13	0	12	1
1926-27	14	0	14	0
1927-28	14	1	11	2
1928-29	16	1	14	1
1929-30	11	0	10	1
1930-31	15	1	14	0
1931-32	18	0	17	1
1932-33	22	2	20	0
1933-34	22	0	20	2
	186	7	168	11

Unsuccessful cases, dying within two years.............. 2

Total unsuccessful cases 13

Although five of the seven patients dying of medical conditions within two years of treatment had no recurrence of hemorrhage, they have not been included. However, the two patients dying of gynecologic conditions within two years have been included in the

list of unsuccessful cases. This leaves a total of 181 cases accounted for, with thirteen failures. The successful cases form 92.9 per cent of the series, the failures 7.1 per cent.

My object in tracing these cases was not only to find what ultimate results have been obtained but, if possible, to find how these results differ in the various types and to decide which type is best adapted to this form of treatment. Answers to these questions may be suggested by an analysis of the end results obtained in the three groups and by a consideration of the unsuccessful cases in each group.

GROUP 1. Seven cases treated to produce temporary amenorrhea have been traced. There was one failure, as follows:

CASE 19. 1921, Mrs. A., aged 35, was given 200 mg. hours intrauterine radiation. Treatment ineffectual, probably because of insufficient radiation.

There are few cases in this group because this type of radiation has never appealed to me and I am not using it at present. Hemorrhage in young women with grossly normal pelvic organs is usually a symptom of some general condition which requires treatment. Radiation in such cases is a radical procedure which should be considered only after all other measures have failed. Even then, supravaginal hysterectomy, with preservation of the ovarian function, is the best treatment in most cases.

GROUP 2. Forty-one cases of hemorrhage, associated with myomatous uteri, have been traced. The results in 34, or 83 per cent, were successful, and in 7, or 17 per cent, unsuccessful. Outline histories of the seven unsuccessful cases are as follows:

CASE 79. 1926, A. G., Negress, was in poor condition due to profuse hemorrhages from a large myomatous uterus. There was improvement for six months after treatment. Upon recurrence of hemorrhage she refused further treatment and her later course is unknown.

CASE 105. 1927, Mrs. W., aged 33, was in poor condition due to profuse hemorrhages from a moderate-sized myoma. Treatment resulted in 18 months' amenorrhea. Periods have been normal since that time and the patient is in excellent health.

CASE 117, 1928, Mrs. A. B., aged 37, and CASE 181, 1932, Mrs. N., aged 42, are similar. After about one year of amenorrhea, each patient began to menstruate at irregular intervals and have so continued to date with no recurrence of hemorrhage.

CASE 143. 1930, Mrs. A. S., aged 40, had a large fibroid. Bleeding recurred one year later and hysterectomy was performed. At the time of the operation the uterus had reduced about one half in size.

CASE 215. 1933, Mrs. C. B., aged 45, was referred to me for treatment of a moderate-sized fibroid, by a surgeon who had decided against hysterectomy because of the poor condition of the patient. After 8 months of amenorrhea,

periods recurred and, as her general condition was much improved, hysterectomy was then advised.

CASE 218. 1929, Mrs. B. S., aged 42, was in poor condition due to profuse hemorrhages. Her hemoglobin was 25 per cent. She had a moderate-sized myomatous uterus with fixed bilateral masses. The case seemed unfavorable for either operation or radiation, but the patient improved greatly after radiation and had no more hemorrhages. She refused to submit to an operation and died in 18 months of cancer of the ovary.

GROUP 3. One hundred thirty-eight cases, with no gross lesion other than subinvolution, have been traced. In two of them a second radiation was necessary within a year. Ultimate results in both of these cases were successful. Results in five of these cases, or 3.6 per cent of the group, were unsuccessful. Their outline histories are as follows:

CASE 9. 1921, Mrs. E. C. had two periods after treatment. Feeling that the treatment had failed, she had hysterectomy performed.

CASE 119. 1928, Mrs. A. also underwent hysterectomy for the same reason. It is possible that a second treatment might have cured them.

CASE 25. 1921, Mrs. H., aged 38, had a period of amenorrhea for 7 months. Periods then recurred normally until her menopause seven years later. There was no recurrence of hemorrhage.

CASE 205. 1933, Mrs. D. C., aged 35, had a period of amenorrhea lasting 8 months. Periods then recurred normally with no reappearance of original menorrhagia. Later she became pregnant and after a normal labor a normal child was born in September, 1935.

Although I am charting this as a technical failure, the patient herself considers the treatment eminently successful and is delighted with the end results.

CASE 163. 1931, Mrs. W., aged 55, lived a long distance from Jacksonville and did not return for treatment. Later I learned from lay sources that bleeding recurred 5 months after her return home and that she died within the year. While the actual cause of death cannot be ascertained, it is possible that a carcinoma of the fundus was overlooked at the time of treatment.

Comparison of results obtained in Group 2 with those obtained in Group 3 indicates that, in this series at least, intrauterine radium treatment will give better results in those cases in which the hemorrhage is not associated with any major gross lesion than it will when the hemorrhage is associated with myomas. In 13 per cent of the myoma cases, second treatments were necessary, as against 3 per cent of uncomplicated cases. Moreover, there were in the 41 cases of myomas 7 failures, or 17 per cent, as against 3.6 per cent of failures in patients who had no gross lesion other than subinvolution, and 7.1 per cent of failures in the entire list.

This 17 per cent of failures in the total series of myoma cases is, of course, much greater than would have resulted in a similar list of patients in good health submitted to hysterectomy. While this

type of radiation is not, as a general rule, to be preferred to surgical interference, it has its place in gynecologic therapy and is preferable to operation in certain cases.

Certain conclusions as to the effect of treatment upon the size of the fibroid have been drawn from those cases which have been observed for several years after treatment. In all successful cases the tumor gradually decreased in size until the uterus became of normal size. Cessation of hemorrhage and disappearance of subjective symptoms manifested themselves more quickly. In most cases there were but one or two periods between treatment and permanent amenorrhea.

Apparently the slow decrease in the size of the myomatous uterus may go on for many years. One case which I have followed closely for fifteen years has been a most interesting study and is typical of a number of others.

CASE 26. 1921, Mrs. M., aged 45, had a uniformly enlarged myomatous uterus about the size of a 7 months' pregnancy. Months of profuse bleeding had greatly reduced her strength and vitality. Hemoglobin was 30 per cent at the time of treatment. She was given two heavy treatments with a 6 month interval between them. Her periods ceased a few months after the first treatment and did not recur. Reduction in the size of the tumor was rather rapid in the first 6 months, but after that went on much more slowly. Some 2 years after treatment the uterus was about half its original size, freely movable. She refused to have a hysterectomy at that time inasmuch as her health was perfect and the tumor, still diminishing in size, gave her no trouble. About two years later, four years after the original treatment, the uterus was normal in size.

The importance of careful diagnosis and proper selection of cases should not be overlooked because the procedures involved in giving the treatments are so simple. This applies to the myomatous cases as well as to those with no gross lesions. If it is neglected not only will there be an increased percentage of unsuccessful cases, but actual damage may sometimes be done. A complete physical examination, especially from the endocrinologic standpoint, is the first essential. The gynecologic examination must be thorough and accurate.

Intrauterine radiation is contraindicated in some gynecologic conditions. We must bar all hemorrhages associated with disturbances of pregnancy. Inflammatory conditions, especially chronic salpingitis, must be excluded. Here, of course, the danger is that the radium reaction will light up some preexisting inflammatory process, as it did in Case 5 of this series. Malignant processes must be recognized, as radiation for malignancy differs from the treatment used for benign hemorrhage. Differentiation between ovarian neoplasms and myomas is necessary.

In selecting myomas for this treatment there are certain estab-
lished criteria. Neither submucous nor pedunculated subperitoneal
myomas should be radiated on account of the danger of producing
necrosis en masse. Emphasis has also been laid upon the size of the
tumor, limiting radiation to growths of a certain size. It seems to
me that of much more importance is the relation of the bulk of
the tumor to the uterine canal. Large growths, in which the uterine
canal is so situated that uniform radiation can be distributed to all
parts of the tumor, are more apt to be favorably influenced than
other types with an asymmetrical development, even though 'the
latter may be smaller. With the bulk of the growth lying at one
side of the canal, uniform radiation is impossible.

The age of the patient is also important. If radical measures are
necessary to control hemorrhage in younger women, supravaginal
hysterectomy, with preservation of the ovarian function, is usually
preferable to radiation with the resultant establishment of a pre-
mature menopause. My rule has been that in patients over 40 radia-
tion is justified. Below this age each case must be decided on its
individual merits.

In conclusion, I want to emphasize that success with this method
depends not only upon the thoroughness with which the procedure
is carried out, but also upon the care used in selecting the cases for
treatment. If one were to outline the type of case for which it is
best adapted, it would be, I think, about as follows: A multipara,
about 40 years of age, whose periods have been becoming gradually
more profuse for a number of years, and who is now tending toward
metrorrhagia. General physical examination is negative. The fun-
dus is soft and somewhat enlarged and the cervical canal so dilated
that the uterine dilator passes up into the fundus with little or no
resistance. There is no evidence of malignant disease, trouble in
the adnexa, or disturbances of pregnancy. In a series of such cases,
a high percentage of successful results may be expected.

CHORIONEPITHELIOMA

G. G. Oswalt, M. D., F.A.C.S., and I. Milton Wise, M. D., F.A.S.C.P.
Mobile

THE comparative rarity of chorionepithelioma justifies a detailed report even of a single case.

Chorionepithelioma was described as early as 1867 by Volkmann. "The idea gained currency that the chorion produced only the destructive polyps while the more malignant tumors arose from decidual cells. This view was maintained by Saenger (1888-1891) who employed the term *deciduoma malignum*. Marchand's theory of the exclusive origin of the tumors has proved entirely correct and has served to connect the various grades of proliferation of chorionic epithelium in one general class, while the clinical relations of the different forms of the disease have been elucidated especially the connection with gestation and hydatid mole."[1]

Among 445 cases collected by Pollasson and Violet, vaginal metastases occurred in 93, pulmonary in 133, cerebral in 40.

In chorionic epithelioma there is usually hyperplasia of all elements of the chorionic villi including Langhans cells and syncytium. All cells are multilayered and edema is often present. Frequently there are large numbers of fibroblasts. Embryonal cells and cells in all stages of mitosis are abundant.

In the benign mole there is usually a much more orderly arrangement of the Langhans cells of the villi, with the absence of embryonal cells and mitosis. Although many benign moles show a proliferation of the epithelium, the difference between this proliferation and that of the malignant mole or chorionepithelioma is usually so clear that recognition is not difficult.

The chorionepithelioma may be defined as follows: "The chorionic villi are covered with two layers of epithelial cells: the inner or so-called layer of Langhans cells is composed of separate cells which are sharply defined and cubical in shape, the outer or so-called syncytial layer is derived from the inner and is composed of flat connecting masses of cytoplasm containing many nuclei."[5]

A tumor arising from the epithelial cells covering the villi is called chorionepithelioma. It is "an epithelial tumor of fetal origin and its cells tend to differentiate as do those covering the chorionic villi. It is usually, therefore, sharply differentiated from other forms of carcinoma by the presence of two kinds of cells, separate

cells which undergo mitosis and which correspond to the syncytial layer."[5]

REPORT OF CASE

Mrs G., aged 29, came to the City Hospital on account of uterine bleeding. Catamenia had been established at 16; the periods had been regular and the flow normal. In 1929 the first pregnancy terminated normally. Eight months later she became pregnant a second time, but miscarried at three months. In 1933 a child was born who died in January, 1934. In August, 1934, the fourth pregnancy occurred. This terminated with the delivery of a mole accompanied by profuse bleeding on December 27, two days prior to admission to the hospital. During November and December there had been intermittent bleeding and the passage of many clots, associated with chills followed by temperatures up to 103.


Fig. 1. Section of curettings showing Langhans and syncytial cells.

Upon admission, hemoglobin was 24 per cent (Sahli). Red cells numbered 1,300,000; white cells 12,250, with 80 per cent polymorphonuclears. She remained in the hospital three days and during this time the bleeding subsided and her general condition improved. She was admitted a second time on Jan. 19, 1935, on account of recurrence of the uterine bleeding. Hemoglobin then was 30 per cent; the red count was 1,380,000, the white count 7,000, with 90 per cent polymorphonuclears.

The patient stated that her last normal menstruation had been in August, 1934; however, her last pregnancy had not been like any other and at four months, the time the bleeding started, she was as large as she had been at term during the previous pregnancies.

On January 21, 250 c.c. of whole blood was given by the direct method. Four days later 450 c.c. was given. On the 28th, hemoglobin was 50 per cent, the red count 2,900,000. Friedman's test was reported positive on the 31st. February 1 she received a third transfusion, 100 c.c.

Curetment was done on February 2. Many fragments of markedly hemorrhagic endometrial tissue were secured.

Microscopic examination of these fragments revealed marked proliferation of the syncitium with many mitotic figures. In some areas the syncitial cells covered the Langhans' cells. Atypical chorionic villi were seen invading the endometrium. A diagnosis of chorionepithelioma was made and immediate panhysterectomy advised. The operation was performed by Dr. Oswalt on February 13.

Gross Description: The operative specimen consisted of the entire uterus and appendix. The uterus measured 10 by 8 cm. It was enlarged about 50 per cent. The tubes showed somewhat pinkish discoloration and were rather bulbous. In the right broad ligament there was a purple ovoid mass the size of a small olive. Both ovaries were somewhat large, rather fibrous and their surfaces were wrinkled. They contained multiple cysts with clear contents.
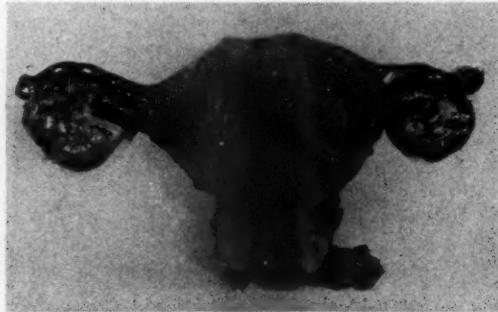
Fig. 2. Photograph of gross specimen.

Upon opening the uterus from the cervix to the fundus the musculature was 1.5 cm. thick. Within the body of the uterus, extending from the internal os to the cornus, there was a dark red, soft, irregular mass which apparently completely filled the uterine cavity (Fig. 2). On the posterior and left surfaces of the uterus this mass had infiltrated the uterine musculature.

Section through the tumor showed that it had infiltrated deep into the musculature of the posterior wall. There were three hemorrhagic nodules, apparently extensions of the tumor. They measured about 3 by 3 cm. The cervix showed no evidence of involvement. There were several old healed scars, but no erosions, no ulcerations. Sections through the ovaries showed several small yellowish areas and a few cysts with clear contents. The tubes were apparently normal.

Microscopic Description: Sections of the mass within the uterus, of the uterine musculature from different areas and of the ovaries were studied. The mass itself showed very nearly the same characteristics as did the sections removed with the curet: chorionic villi, embryonal in character, covered by syncytial cells containing large numbers of multi-nucleated cells varying in size and shape. The Langhans cells were hyperplastic with large numbers of mitotic figures. Within the uterine musculature there was one rather large nodule with the same characteristics as the original tumor. In other places

there was infiltration of the myometrium by groups of syncytial and Langhans' cells (Fig. 3). Section of the ovary failed to reveal any extension of the tumor.

Diagnosis: Chorionepithelioma with extension into the musculature.

One week postoperative the Friedman test was negative and the x-ray examination of the chest was negative for metastasis.

The patient had an uneventful postoperative recovery and on February 12, red cells 2,875,000; hemoglobin 50 per cent; white cells 5,500 with 60 per cent polys. The patient was discharged from the hospital on February 26, with instructions to return to the out-patient department for regular examination and repeated Friedman's test.

Fig. 3. Section of uterine musculature showing extension of the tumor.

Blood Sedimentation Rates:

Cutler	2/12/35	33 mm. in one hour
	2/20/35	34.5 mm. in one hour
	2/26/35	32 mm. in one hour
Friedlander	2/12/35	18 mm. in 20 minutes; 24 mm. in 26 minutes
	2/20/35	18 mm. in 15 minutes; 24 mm. in 19 minutes
	2/26/35	18 mm. in 18 minutes; 24 mm. in 26 minutes

Follow-up: Friedman's test, repeated on March 15, was negative. Biopsy from the vaginal vault showed granulation tissue with no evidence of recurrence of the tumor. On May 15, Friedman's test was again negative. X-ray examination of the chest May 24 was negative for metastasis. The patient was frequently seen up and about but has refused to be reexamined or x-rayed since May, 1935. She was last seen on the street in January, 1937, apparently in good condition.

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ACUTE INTESTINAL OBSTRUCTION

A Comparative Analysis of Three Series Totaling 715 Cases

FREDERICK FITZHERBERT BOYCE, M. D.,

with

ELIZABETH M. MCFETRIDGE, M. A.

New Orleans

IT is literally true, paradoxical though it may seem, that the secondary consequences of intestinal obstruction are far more important than the primary disease. The interruption to the fecal current is serious, of course, but it is nothing like as serious as its consequences: perversion of the normal blood chemistry and circulatory damage in the bowel wall. One or the other of these changes is inevitable in any obstruction which is not promptly corrected, and both may coexist in the same case.

Intestinal obstruction may be considered from two aspects, the site of the obstruction, whether high or low, and the type of the obstruction, whether simple or strangulated. In simple high obstruction regurgitant vomiting is the most notable symptom. Vomiting causes a loss of body fluids, and with this dehydration is associated a disturbed physicochemical balance, which is chiefly manifested by the loss of sodium and chloride ions. In simple low obstruction vomiting is a late feature and may even be absent throughout the course of the disease. The chief consideration here is the increasing distention in the intestinal tract proximal to the point of obstruction, from which, if it remains uncorrected for any length of time, there will inevitably result vascular changes and necrosis of the bowel wall, with the development of a deepening toxemia. Unless high obstruction, as may happen, of course, is associated from the outset with a vascular factor, circulatory changes in the bowel wall are distinctly unusual. Regurgitant vomiting, whatever other dangers it may introduce, is a protective mechanism in the sense that it prevents the development of the distention from which, in low obstruction, the vascular changes and the consequent toxemia always arise.

The production of these vascular changes is easily explained. As the distention within the bowel continues unchecked and as it increases and is perhaps aggravated by the use of purgatives, the intra-enteric pressure gradually approximates the venous pressure. The venous system, as a result, becomes compressed, sometimes to the point of actual obliteration, so that the blood which enters it

cannot leave. As the pressure within the intestine increases there is also a slowing up of the blood in the arterial system, and a point is finally reached at which the intra-enteric pressure equals the systolic pressure. When both the arterial and the venous supply have been thus obliterated, the first result is necrosis of the bowel wall, and the second result is gross perforation. Furthermore, as soon as the mucosa of the bowel wall becomes necrotic, its permeability is altered, so that the toxic contents of the lumen, which normally, when the bowel wall is intact, cannot be absorbed, seep through it into the peritoneal cavity, which is entirely unprepared to receive them. The final result is a fatal toxemia, the patient often dying before peritonitis develops.

Obstruction of the colon is equally as dangerous as obstruction in the small bowel. If the ileocecal valve remains competent, as we believe it usually does,[1] the contents of the ileum are forced by peristaltic action into the large bowel, where, since regurgitant vomiting is no part of the picture, there occurs an increasing distention. For all practical purposes obstruction in the large bowel with a competent ileocecal valve is a closed loop obstruction. The pressure within the bowel rises rapidly, vascular changes take place promptly, for the reasons we have already set forth, and gross perforation develops with equal promptness. The patient with an untreated low obstruction may perhaps live longer than the patient with high obstruction, because, in the absence of an initial vascular factor, the consequences of the original trouble manifest themselves more slowly, but the outcome is just as surely fatal.

It is evident from what we have already said that the causes of death differ in high and low obstruction. The patient with high obstruction dies of dehydration and of perversion of his normal physicochemical balance. The patient with low obstruction dies of the toxemia resulting from vascular changes in the bowel wall, peritonitis sometimes, though not necessarily, being a part of the picture. It must be remembered, too, that patients with intestinal obstruction are just as likely to die of such conditions as pneumonia, shock and similar complications as are any other surgical patients, or of pre-existing cardiac or renal disease. In other words, they run the risk of any surgical patient with or without organic disease, plus the grave added risks inherent in their intestinal complication.

The sudden death which sometimes follows the relief of simple obstruction was once supposed to be due to absorption by the intact bowel of the toxic products of the damaged bowel after the release of the mechanical block had permitted them to flow into it. This theory is no longer held. Such deaths, every surgeon knows, are

just as likely to occur after enterostomy, by which the contents of the damaged bowel are diverted externally. Furthermore, twenty years ago Wilkie showed that toxic matter could not be absorbed by an intact bowel, and other workers have confirmed his observation. Elman[2] believes that in such cases death is due to the fact that there is loss of blood and fluid into the splanchnic area through the paralyzed and dilated intestinal capillaries. The theory is interesting but our belief, as we shall explain later, is that in many such cases death is akin to the so-called "liver death" which follows operations on the gallbladder. Elman's[3] own cases seem to us to be of this type.

Schutz,[4] in 1934, published a most excellent article based on the postmortem study of 25 low obstructions. Radical operation was done on 4 patients, 5 were treated by enterostomy, 10 were treated by decompression, and 6 cases, incorrectly diagnosed, were treated as paralytic ileus. The lesson of the last 16 cases is so clear that we need not elaborate upon it. We agree with Schutz that high obstruction is intrinsically more dangerous than low obstruction, but if the statistics were separated, they would show that actually the mortality for low obstruction is greater. His description of low obstruction and of its progress could scarcely be improved upon.

Dividing low intestinal obstruction into two stages, the first or primary mechanical stage, and the second or degenerative stage, Schutz points out that in the first stage both the patient and the bowel are in good condition. There is no appreciable change in the temperature, pulse, leukocytosis, urine or blood chemistry. The loops of bowel are dilated and contain an excess of fluid, but they remain approximately normal in firmness, elasticity, translucency and color. At this time the symptoms and signs are chiefly pain of a cramping character, hyperperistalsis, uneven distention, sometimes vomiting, and obstipation, which may or may not be complete.

In the second or degenerative stage conditions have entirely changed and both patient and bowel have literally gone bad. The patient shows a profound toxemia, its manifestations being variously a muttering delirium, listlessness, or fibrillary twitchings of the muscles of the face and extremities. The abdominal distention increases and there is frequent regurgitation of small amounts of foul, brownish fluid (incorrectly called fecal vomiting). Temperature, pulse and leukocyte count alike rise, the urine frequently contains albumin, and the blood chlorides decrease. The loops of bowel have lost their previous elasticity and firmness and are so friable that the slightest touch may cause rupture. They have an opaque grayish or purplish appearance near the point of obstruction

and give the impression of an incipient necrotic process. In this stage the cramping pain of the first stage is replaced by constant pain.

This description, as we have said, could scarcely be improved upon, and the most important thing to note in it is the speed and the insidiousness with which the first stage, when both patient and intestine are in good condition, passes over into the second stage, when both patient and intestine are in poor condition.

It is unnecessary in a paper of this sort to discuss symptomatology and diagnosis in detail. Whether or not one chooses to be as violent as Taylor,[5] who says that the surgeon who overlooks intestinal obstruction lays himself open to actions at law for malpractice if not for manslaughter, it is fair to say that the physician who has had any experience with acute abdominal disease can usually diagnose this condition when he encounters it, or can at least suspect it. No early cases, and few late ones, show all the classical symptoms, "the signs of lost opportunity," as Sampson Handley[5] calls them. Suspicion is enough. "A convincing, irrefutable clinical diagnosis," as Lord Moynihan says, is desirable, but not really important. The only really important thing is to realize that either an obstruction or some other intra-abdominal state which demands urgent action is present. It would seem more logical, says Finney,[6] "to do a few more unnecessary exploratory operations on live patients than to continue the long and melancholy roll of hurried enterostomies on moribund ones."

A few diagnostic aids may be briefly mentioned. Carson's is a helpful differentiation: the higher the obstruction the more constant are the symptoms, especially vomiting, while the lower the obstruction the more constant are the signs, especially distention. Codman[7] emphasizes the value of rectal examination, which reveals an empty rectum with the walls crowding around the finger, while above is tremendous pressure. Deaver[8] advises auscultation of the abdomen, either with the stethosope or with the naked ear. In the early stages, he points out, there is hyperactive, noisy, whirring peristalsis, which ceases absolutely at the point of obstruction. In the next stage there is a high-pitched, bell-like tinkle, due to gas and fluid moving in a tubular space. In the final stage there is the "ominously silent" abdomen, in which all activity has ceased and the only sound is the pulsation of the aorta. These are all perfectly feasible methods of observation, but because of their very simplicity they are frequently overlooked.

Urinalysis and blood count should be routine. The latter will reveal very little in the early stage, though it will be helpful in the

later stages, when inflammatory changes have set in. Studies of the blood chemistry are not essential for either diagnosis or treatment if the proper clinical observations have been made, and there is never any excuse for delaying treatment to make them. Even if one is unable to determine accurately whether the obstruction is in the large or small bowel, the use of replacement therapy (glucose and saline intravenously), which is urgently indicated in high obstructions, will do no harm in low obstructions. Blood chemistry studies take little time, however, and if they are repeated, they are of definite prognostic value, and they serve to indicate, after the obstruction has been released, when it is safe to discontinue replacement therapy.

The same reasoning holds for the x-ray.[9] No time should be lost in employing it, though usually no time need be. In the doubtful case, particularly the early case, x-ray examination is frequently very helpful, though it is by no means as accurate as some observers declare it to be. In the face of an x-ray confirmation of one's clinical diagnosis there is never a justification for delay in operation. In the face of a positive x-ray in the absence of a clinical diagnosis, the surgeon would do well to review his position and to make certain of his findings before he withholds operation. In the face of the occasional x-ray denial of his clinical findings, the surgeon is justified in ignoring the x-ray and following his clinical judgment. That this has been a valuable measure in many cases there is no doubt, but there is also no doubt that slavish reliance upon it has caused more than one disaster.

In high intestinal obstruction, as we have pointed out, the essential feature of preoperative preparation is the replacement of lost fluids and lost body elements, a procedure which consumes very little time, and can, indeed, be carried out simultaneously with the operative act. In low obstruction the need is different. Here the relief of distention is the chief consideration. This is best achieved by the method of decompression devised by Robertson Ward and recently popularized by Wangensteen,[10,11] whose name it now bears. It is not needed in obstruction of the upper bowel, where vomiting takes care of the distention. It is useless in obstruction of the large bowel, in which, as we have pointed out, the obstruction is usually of the closed loop variety. But it is a very valuable preoperative measure in obstruction of the lower small bowel, while preparations for surgery are being made. It is of distinct advantage also in that it decompresses the bowel gradually rather than abruptly, thus paving the way for surgery, as it were, and preventing an abrupt change in

intra-enteric pressure, upon the risk of which we have already commented.

We cannot assert too emphatically that in our opinion decompression should never be regarded as a substitute for surgery in intestinal obstruction. Wangensteen himself has achieved excellent results with it as a curative measure, and enthusiastic followers have declared that it has removed intestinal obstruction from the field of emergency surgery. Wangensteen himself has made no such claims for it. When he revived the method, he was careful to point out that it does not apply to obstruction of the strangulation type, that it is adapted only to incomplete obstruction or to the simple complete variety, and that even then it must be used with the strictest precautions and the most careful observation, almost tentatively, as it were.

But even those strict indications are hedged with danger. Some surgeons, of whom the author of the method is one, are apparently able to distinguish between complete and incomplete obstruction, and between simple and strangulation obstruction. We cannot and we are quite certain that the group to which we belong is considerably larger than the group to which Wangensteen belongs. That is the first point. The second point is that even Wangensteen's own excellent judgment was wrong in certain of his cases and surgery had to be resorted to because decompression did not succeed. Such delay means the loss of precious time and may mean the turning of the scale against the patient. This is a disease, be it remembered, in which the time element takes precedence of every other consideration. A final point might also be mentioned: this method, like all others, is certain to be used unwisely and in cases for which the author never intended it. That is not his fault, of course, but the facts of the matter are not altered for that reason.

For our own part, we believe that the surgeon who uses decompression as a substitute for operation assumes a far greater responsibility than the surgeon who insists on operation in all cases of suspected intestinal obstruction. Wangensteen himself reports a remarkably low mortality following decompression, either alone or combined with operation when it was not sufficient in itself. Others are not so fortunate. The mortality in the New Orleans Charity Hospital has risen in the last three years, we shall point out shortly, and for our own part we believe that the use of this method on ill-advised indications and in improper cases has had much to do with the increase.

Our own experience in the last two years with four referred cases seems to prove this point. One patient was a white woman 73 years

old, with a lesion of the central nervous system, on whom decompression was practiced for more than two weeks. Her obstruction was evidently not complete at first, but it was complete when we operated on her. She was so ill, in fact, that the operating room sister begged us not to put her on the table, and she recovered only after a convalescence in which she went even closer to the gates of death. A negro woman, decompressed for four days, required a resection for gangrene of the small bowel; she recovered after a convalescence which included pneumonia and which left her with a fistula which has not yet been closed. Another negro woman, decompressed for two days, required resection for extensive gangrene of the small bowel; at autopsy the entire large and small bowel was included in the gangrenous process. Still another negro woman, decompressed for more than two days, died on the table before the anesthetic could be begun.

The last case probably showed the worst sort of judgment on our part. The woman was plainly moribund—but on the other hand, her chances without surgery were nil. All the cases probably show bad judgment in instituting decompression, or in continuing it when it was so evidently unavailing. But that sort of thing is going to continue to happen if decompression is regarded as a substitute for surgery. The patients who recovered, by the way, did not owe their lives to any skill of ours. They should have died, and the only thing that saved them is what Royster[12] calls "the saving grace that prevents the patient from going any farther." The conclusion of the whole matter, so far as we are concerned, is that more patients are likely to be saved by prompt surgery, even though it be less than expert, than can possibly be saved by substitutes for it.

In one type of case, though we mention it with trepidation, decompression may possibly be used as a temporary substitute for operation. We refer to the type of hopeless case in which enterostomy through the first presenting loop is all that the patient can stand. Usually he cannot stand even that. Such a procedure involves the strain of anesthesia and the trauma of opening the abdomen, and perhaps under such circumstances temporary decompression would be less harmful. Neither method, however, holds out any hope of salvation.

In 1929 the late C. Jeff Miller[13, 14] published a study of intestinal obstruction, which included 171 cases from the New Orleans Charity Hospital covering the period from 1923 through 1927. The mortality was 70.7 per cent. In 1934 Moss and McFetridge[15] published from the same institution a series of 340 cases covering the period from 1930 through 1934. The mortality was 31.7 per cent, less

than half of the Miller series. It has seemed to us profitable to
continue those studies, and we are herewith adding to them 204
cases covering the period from 1933 through 1935. The mortality
is 36.3 per cent, considerably less than Miller's, though somewhat
higher than Moss'. Certain comparisons between these series are
interesting and illuminating.

In our own series there were 106 cases in the white race against
98 in the negro, which is approximately the proportion of hospital
admissions in each race. The mortality was practically the same,
35.8 per cent for the white patients and 36.7 per cent for the
negroes. There were 108 cases in males and 96 in females, not a
very marked difference, but the female mortality of 42.7 per cent
is considerably higher than the male mortality of 30.6 per cent. It
is chiefly to be explained by the high mortality in hernias in women,
45.8 per cent (11 of 24 cases) against the male mortality of 28.8
per cent (10 of 35 cases). Other less obvious reasons may of course
be operative.

As is usually the case, intussusception was the most frequent cause
in the very young and malignancy and strangulated hernias in the
aged. Adhesions, volvulus and miscellaneous causes were responsi-
ble in the middle years, the incidence of volvulus at this period, it
seems to us, being slightly higher than is usually noted.

TABLE 1

DISTRIBUTION OF CASES ACCORDING TO ETIOLOGIC FACTORS

	Miller	Moss	Boyce
Hernias	31.0	46.2	28.0
Adhesions and bands	26.9	26.7	35.8
Intussusception	11.6	5.3	7.9
Volvulus	10.5	8.5	8.4
New growths	5.2	1.2	5.4
Peritonitis	3.5	4.7	2.0
Foreign bodies	0	2.9	5.0
Miscellaneous	1.2	0.9	2.5
Undetermined	9.9	3.5	3.5

Table 1 shows the distribution of cases in the three series and
Table 2 the mortality. Hernias, which formed the single largest
group in both Miller's and Moss' series, have dropped to second
place in ours and have been replaced by adhesions and bands, which
occupied second place in both the other series. In our series, 46.6
per cent of the cases due to adhesions had had previous operations,
against 24.2 per cent in Miller's series. This increasing incidence
seems to bear out the contention of several writers that obstruction
from previous surgery is likely to increase with the increase in

abdominal operations, every one of which is a potential case of ileus. Adhesions from pelvic disease, with or without surgery, are a frequent cause of obstruction in the negro woman, as Boland[12] and others have noted. This disease is always more severe than in the white woman, and when surgery is done, peritonealization of the raw surfaces is of necessity frequently a desire rather than an attainment.

The mortality for hernias in Moss' series had fallen to 22.3 per cent, more than a two-thirds reduction from the 77.3 per cent of Miller's series. In our series it has risen to 35.6 per cent. Several explanations are possible. A large number of our patients were men beyond middle life, who had cardiorenal and similar constitutional complications. In several instances ill-advised attempts at taxis so damaged the bowel that extensive surgery was necessary. Finally, the mortality in both umbilical and ventral hernia was very high, 4 of 9 cases in the first classification and 5 of 7 in the second. Most of these patients were elderly females with degenerative diseases, and very, very obese. One of them weighed more than 400 pounds.

The mortality of intestinal obstruction due to new growths, which was 77.7 per cent in Miller's series and 50 per cent in Moss', has risen even higher in ours, to 81.8 per cent. Rankin[16] estimates that even with the simplest possible surgery the mortality for this type of obstruction will be at least 30 per cent and will rise as more extensive surgery is done. In our series simple drainage of the bowel was done in 8 of the 11 cases, all poor risks, with 7 fatalities. Burgess[17] points out that the risk of overlooking strangulation by the performation of blind cecostomy for supposed malignancy, a procedure which entails a 60 per cent risk in the small bowel, is less than 2 per cent in the large bowel. But even that simple operation is attended by enormous risk, as this series shows, while in the 3 cases in which radical operation was done, the 2 fatalities might have been expected.

TABLE 2

MORTALITY IN RELATION TO ETIOLOGIC FACTORS

	Miller	*Moss*	*Boyce*
Hernias	77.3	22.3	35.6
Adhesions and bands	65 2	35.1	26.7
Intussusception	55.0	27.7	18.7
Volvulus	72.2	51.7	47.1
New growths	77.7	50.0	81.8
Peritonitis	66.6	50.0	50.0
Foreign bodies	....	40.0	40.0
Miscellaneous	50.0	100 0	60.0
Undetermined	82.4	50.0	57.1

The lowest mortality in our whole series was in intussusception, 18.75 per cent, against 55 per cent in Miller's series and 27.7 per cent in Moss'. Ten of our patients were under 2 years of age and 5 more were under 10 years. Nine of the patients were seen within 24 hours and 4 more within 48 hours, and in only 2 cases was resection necessary. Therein lies the secret of the lowered mortality. Ladd,[18] in a review of 372 cases of intussusception, points out a fact attention to which might well have reduced the mortality in this series still further. In his study he notes a recurrence of only 1.8 per cent, which proves, he says, the unwisdom of adding fixation to the reduction of the obstruction at the original operation. It adds a disproportionate and entirely unnecessary risk to the procedure, particularly as recurrence does not always take place at the original site of intussusception. His advice to keep children warm on the operating table is also worth bearing in mind, and could well be applied to all individuals with intestinal obstruction. As some other writer puts it, the patient who is put on the table cold is likely to be taken off colder.

Moss calls attention to the fact that in his series the proportion of radical operations has been reduced to 14 with 7 deaths, 50 per cent, against the 28 such operations with 26 deaths, 93 per cent, done in Miller's series. The drop, he says, indicates that not only was the procedure used on sounder indications but also in a wiser selection of cases, unwisely chosen though some of them probably were. In our series radical operation was done in 30 cases with 17 deaths, 56.6 per cent, lower than Miller's mortality but considerably higher than Moss'. In 2 cases the resection was done in children and the surgeon probably had no other choice, but surely after childhood, when it is not well tolerated, the simple procedure of exteriorization should be used more often than it is. It was employed only twice in this series, one of the cases offering a hopeless risk. A less extensive type of surgery, even though it necessitated secondary operations, would surely reduce the death rate. Paterson's[19] declaration that resection and anastomosis have no place in intestinal obstruction is probably correct in principle, extreme though it sounds. Certainly it is in line with Bunnell's[20] declaration, which all surgeons would do well to remember, that in intestinal obstruction every manipulation is a shove nearer the grave. Neither in Moss' series nor in our own was plication of the bowel used; this is an inherently dangerous procedure which was responsible in 12 cases in Miller's series for a mortality of 97.5 per cent.

When the discussion as to the value of enterostomy first began to rage Van Beuren and Smith[21] from the Presbyterian Hospital

pointed out that the matter should be settled statistically, on the basis of the total mortality of a given series versus the mortality of the enterostomy and the non-enterostomy groups, and the percentage of late cases (over 48 hours) in each. While their own figures for two series, from 1916 through 1919 and from 1920 through 1923, are not conclusive, they believe that in the second group the figures for the cases in which enterostomy was done, in view of the high percentage of late cases included, showed a definite improvement due to this procedure.

TABLE 3

COMPARATIVE FIGURES FOR ENTEROSTOMY AND NON-ENTEROSTOMY CASES			
	Miller	*Moss*	*Boyce*
Total mortality	70.7	31.7	36.3
Mortality for enterostomy	80.0	50.6	53.4
Proportion of late cases	77.5	66.3	69.0
Mortality for non-enterostomy	66.4	19.7	29.3
Proportion of late cases	55.7	30.0	48.6

Table 3 shows the figures, made up on the basis of Van Beuren and Smith's suggestion, for the three series from Charity Hospital. While these are no more conclusive than theirs, certain facts must be taken into consideration. One is that in Miller's series enterostomy was done only on poor risk patients, many of whom were actually moribund. In both our own and Moss' series this type of patient was naturally represented in the enterostomy group, but there were also included fair risk patients and a certain number of other patients with whose recovery enterostomy had nothing to do. These were excellent risks and there seemed no indication for the procedure, in the light of our backward look, except for the fact that it was the custom of the service.

Enterostomy, it should be emphasized, is by no means the trivial procedure it is sometimes supposed to be. There is no argument that a live patient with an enterostomy is better than a dead patient without one, but at that, the method ought to be used only when it is really indicated. However expertly it is done, there is always the possibility of leakage with consequent peritonitis. A persistent fecal fistula may mean a fatality when closure is attempted. We ourselves have seen two cases in which spontaneous closure supposedly occurred but in which the fistula reopened some months later with evisceration of the wound, in one case with a fatal outcome. The operation should be employed for the relief of distention rather than for the drainage of the bowel; indeed, if the bowel wall is already paretic, it is useless. If it is employed, gradual decompression by the method suggested by Elman, by which a sudden drop in

intra-enteric pressure is avoided, seems more reasonable than the usual method of immediate release of the bowel contents.

Moss contends that a large part of the reduced death rate in his series is due to the employment of spinal analgesia, a contention which we cannot accept unreservedly. This type of anesthesia is practically routine on certain services in Charity Hospital, local and general anesthesia being reserved for bad risks. That situation was coming to pass in the period included in Miller's study, and has existed in the period included in Moss' and our own.

TABLE 4

RELATIVE USE OF VARIOUS TYPES OF ANESTHESIA

	Miller	Moss	Boyce
Local	35.6	7.3	7.3
Spinal	19.8	70.0	80.4
General	41.5	22.6	12.3

Table 4 shows the proportion of cases in which the various types of anesthesia were used in these three series, and Table 5 is the mortality for each. In all the series local analgesia was clearly reserved for the bad risks, the patients who were already at the point of death. In both Miller's series and our own general anesthesia gave the lowest mortality, and while in our own series the number of cases (25) is too small to justify conclusions, the fall in the death rate in it may perhaps presage a more rational use of all types of anesthesia. Our own feeling is that if the patient is seen early and is a good risk, the type of anesthetic is a matter of small moment, just as it is in the moribund patient, who is going to die anyway. But the patient who is a poor risk, yet for whom there may still be salvation, is another matter, and for him we do not believe that the routine use of spinal analgesia is justified. Such patients are frequently badly shocked, their blood pressure is low, and aside from any other consideration, it seems illogical to submit them to a type of anesthesia in which a further fall of blood pressure is likely to occur.

Our position is strengthened by the fact that of the 16 patients in the three series who died on the table, 11 died under spinal analgesia against only 1 who died under ether. The remaining 4 patients, who died under local analgesia, were beyond salvation and may be dismissed from our discussion. It is worth mentioning, too, that 6 patients in our series who had spinal analgesia went into very severe shock on the operating table, while the 12 deaths signed out as shock and the 5 deaths signed out as pneumonia all followed this same type of anesthetic.

We are interested in the group of cases, 10 in all, in which obstruction was due to foreign bodies. In 6 cases the foreign body was a fecalith, one of which had a persimmon seed in the center; the other cases variously exhibited parasites, gallstones, a lithopedion and a bolus of potatoes. Caylor and Nickel[22] have recently reported 46 cases of obstruction by a bolus of food, including one of their own, and we observe that potatoes were responsible in 2 instances. Hargrave and Hargrave[23] since then have reported 2 cases of acute intestinal obstruction caused by persimmon phytobezoars.

TABLE 5

MORTALITY FOR VARIOUS TYPES OF ANESTHESIA

	Miller	*Moss*	*Boyce*
Local	98.3	76.0	86 6
Spinal	70.5	22.2	32.9
General	46.4	42.8	28.0
Total	70.7	31.7	36.3

The mention of food brings us to the question of the dietary indiscretions which sometimes precede intestinal obstruction, just as our studies of acute appendicitis have shown us they often precede that disease, always confusing the diagnosis and always increasing the mortality. Eleven such cases occurred in Miller's series, with 7 fatalities, and 3 of the 4 similar cases in our series were fatal. Particularly in this type of case purgatives are likely to be resorted to, and while they are less harmful than they are in acute appendicitis, they are far more harmful than is generally realized. The tendency to take them is particularly notable in the negro, and the result is always the same, an increase in the already hyperactive peristalsis, with further distention of the obstructed bowel, and finally rupture. In the same connection we might add that we do not advise the delay caused by trial by enema. The results are usually inconclusive, and the demonstration of obstipation in these patients seems to us an unjustified waste of time.

That strangulation obstruction is responsible for a higher mortality than simple obstruction is generally known, though the knowledge is not always applied as it should be. McIver,[24] in a study of 335 cases from Massachusetts General Hospital, showed that when strangulation was a factor, the mortality was increased from 37 to 55 per cent. Unfortunately in many of our cases the pathologic description was so inadequate that little could be gathered from it, but the cases in which the distinction could be made clearly prove this point. Without vascular changes the mortality

was 16.2 per cent. With vascular changes the mortality was 58.2 per cent, roughly three and a half times higher.

The crux of the whole situation is the point we have reserved till the last, that we might emphasize it more strongly. It is a point that we fear is often lost sight of in the welter of experimental observations, biochemical studies and proposals for non-surgical treatment. Yet no other consideration can take the place of this one, that the time element is first, last and always the most important fact in intestinal obstruction. The patient who is operated on early is likely to be saved. The patient who is operated on late is almost certain to be lost. There is probably no other surgical state in which the time element counts for so much. It is important in simple obstruction, it is doubly important in high obstruction, in which there is literally not a moment to lose. In this series, just as in Miller's and Moss' series, the mortality rose steadily hour by hour. It began with 5.9 per cent at 12 hours, it ended with 64.9 per cent after 96 hours. The mortality for patients seen under 48 hours was 20 per cent. The mortality for patients seen after 48 hours was 54.1 per cent. These figures need no elaboration.

It must be remembered, too, that as the local trouble increases, the patient's constitutional illness likewise increases. That the toxemia of intestinal obstruction exists there is no doubt, just as there is no doubt of its fatal consequences. How it develops is fairly well known. What it is is still one of the unsolved mysteries of medicine. And for it there is no known remedy. All our endeavors so far have ended in blind alleys, and the only way to control it is not to let it develop, which makes the time element, from this standpoint, one of enormous importance.

We became interested in the so-called liver factor in intestinal obstruction in the course of our studies[25,26,27,28,29] on liver deaths following gallbladder surgery. This type of death occurs a few hours or a few days after operation, frequently in patients who are excellent or reasonably good surgical risks, and in whom a minimum of surgery has been done. It occurs in two forms, with hyperpyrexia or with delayed uremic symptoms, depending upon the duration of life.

We believe that certain deaths in intestinal obstruction are exactly akin to such deaths after gallbladder surgery. The clinical manifestations are the same, extreme hyperpyrexia, with oliguria or complete anuria if the patient happens to live long enough; in intestinal obstruction he usually does not. If postmortem is done, there is an absence of all positive findings which could explain death, other than necrotic changes in the liver, associated with similar degenerative

changes in the convoluted tubules of the kidneys if the patient has lived long enough. We explain these tragedies on the basis of an existing liver insufficiency, not great enough to affect the body economy in the ordinary routine of life, but completely unable to withstand any additional strain, which, in intestinal obstruction, is the overwhelming toxemia associated with the vascular changes in the bowel wall. In 14 cases in these three series we noted clinical evidence of such liver insufficiency and in 9 others we found postmortem changes typical of it.

Cole and Elman[30] have interested themselves in this problem also and they have been able to reproduce such changes in experimental obstruction. They have proved their point by liver function tests as well as by the histologic changes observed at necropsy. To us this problem is an exceedingly interesting and important one, and furnishes an aspect of intestinal obstruction which so far has been generally overlooked.

We should like to stress, in conclusion, the importance of postoperative treatment. The administration of fluids, the use of glucose and saline, the free use of opiates, and the use of anti-shock measures are routine postoperative measures today. We believe, in addition, that the Wangensteen method of decompression has an enormously important field after operation, not only to relieve distention and to drain the bowel but also to protect it, as it were, until it can regain its normal tone. We believe also that not enough emphasis has been placed on the complete restriction of fluids by mouth for a period varying from 24 to 72 hours after operation, depending on the indications in the individual case. However slight the damage may have been, the bowel is always in a critical state after intestinal obstruction, and very little is needed to convert it into the adynamic variety of ileus, against which surgery is powerless. The careless use of fluids by mouth immediately after operation is a most potent means, we believe, of bringing on this state of affairs and is one of the most frequent causes of death in those cases in which death should not occur.

If an apology be needed for another contribution to the subject of intestinal obstruction, it would seem to lie in the fact that its problems are still largely unsolved. The mortality has been reduced, it is true, but it still ranges from 25 to 50 per cent, with the higher figures, in our opinion, more likely to be correct than the lower ones. Christopher and Jennings[31] have recently reported a collected group of cases, comprising 2,345 in all, with a mortality of 46.5 per cent. That is the true mortality of the disease, and until it is reduced to the irreducible minimum, which is not likely ever to be lower than

10 or 12 per cent, it is incumbent upon us all to continue to study the subject and to try to do something about it. The chief thing we can do is to emphasize, in season and out, that in this disease nothing else matters so much as the time that elapses between the onset of symptoms and the institution of surgical treatment.

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CHOLEDOCHUS CYST

Report of a Case

J. W. BODLEY, M. D., F. A. C. S.

Associate Professor of Surgery, Department of Surgery, University of Tennessee

Memphis

MANY theories have been advanced concerning the origin of choledochus cyst, and doubtless each one correctly explains its origin in certain cases. It is generally agreed, however, that in the majority it arises primarily from a congenital defect in the duct, either a weakness of its walls or malformation, which results in partial or complete occlusion.

Gross,[2] in an article published in 1933, quoted the various theories in explanation of the anomaly and reported the collection of 100 authentic cases of patients of all ages in which it had been found. In this group were included, with a few exceptions, the 83 cases collected by Zinninger and Cash[7] in 1932. Of the 100 patients, 52 had had symptoms since the ninth year of life or earlier. Forty-five of the 52 were under 15 years of age, and 32 were under 10 at the time of discovery of the cyst. In one case, the cyst was present in a fetus. In these two series, the incidence was three and four times higher, respectively, in females than in males.

Three additional cases have since been described. One, that of a girl, aged 12 years, with a history of symptoms for fourteen months, was reported by Weber[5] in 1934; the second, that of a woman, aged 62, who had had symptoms for seven years, was reported by Duff[1] in 1934; and the third, that of a boy, aged 4 years, whose symptoms had existed for only three days, was presented by Swartley and Weeder[4] in 1935. The last, according to Gross' classification, raises to 53 the number of those whose symptoms began before the ninth year.

We are herein reporting a further case, that of a girl aged 2 years, bringing the total number of patients of all ages to 104, of those under 15 years at operation to 48, under 10 years, including the fetus, to 35, and of those whose symptoms had persisted since early childhood, to 54.

REPORT OF CASE

L. M., a negro girl, aged 2 years, was admitted to the pediatric service of the Memphis General Hospital on Aug. 21, 1929. According to the history, she had been ill for one month, her symptoms having been restlessness, loss of appetite, loss of weight, frequent urination, and nocturia. The urine had been so highly colored as to stain her clothes, her sclera had become yellow, and her skin had acquired a peculiar hue.

From her general appearance, the child was acutely ill. Her skin was jaundiced, dry, and flabby, and the sclera also were jaundiced. On examination, there was a smooth, nodular mass in the abdomen, chiefly on the right but extending across the midline, from the costal margin above to one inch below the umbilicus, and attached posteriorly. The liver and spleen were easily palpated. The abdomen was not tender, and the child seemed to be comfortable when undisturbed. She had no fever. The urine was deeply colored and the stools were white.

Fig. 1. Drawing from x-ray, showing cyst outlined by barium in small intestine.

The van den Bergh reaction, direct positive immediate, was 37.5, and indirect positive immediate, 50. The non-protein nitrogen of the blood was 33.33. A cell count showed slight anemia. Otherwise, the blood studies were negative. Cystoscopic examination of the kidneys and bladder showed a few blood and pus cells, but pyelograms of the kidney disclosed neither evidence of a filling defect nor signs of pressure from without. All other organs appeared normal.

A roentgenogram made following the ingestion of a barium meal revealed a partial outline of the mass displacing the small intestine, but its exact nature could not be determined.

The surgical diagnosis was echinococcus cyst of the liver or cyst of the pancreas, or, more likely, because of the rapid progression of symptoms, retroperitoneal sarcoma. The possibility of a common duct cyst was considered but dismissed on account of the rare incidence of the disease.

On opening the abdominal wall, a mass the size of a small grapefruit was found in the upper abdomen, below and posterior to the liver and attached to its under surface. The major portion of the mass was situated to the right of the superior and descending segments of the duodenum. It was anterior to the kidney and extended back to the kidney fossa, and its lower border, which was lying beneath the colon, reached the level of the umbilicus. Medially, and in direct contact with its posterior wall, was the head of the pancreas. The peritoneum in this area was ¼ inch thick.
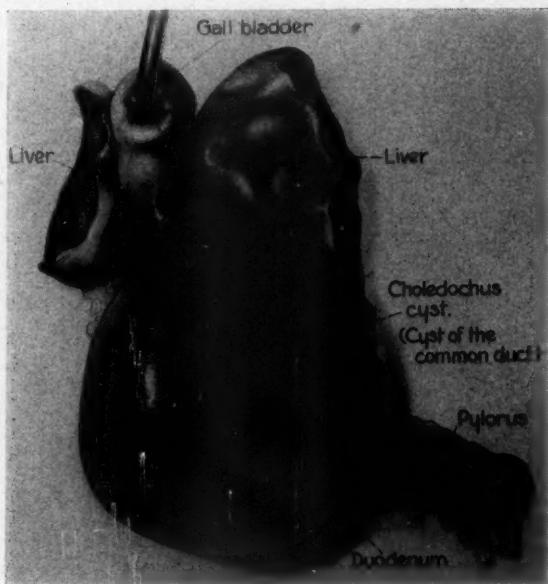

Fig. 2. Cystic enlargement of common duct.

The peritoneum was incised longitudinally and reflected back, thus exposing a tense, cystic tumor or diverticulum of the common duct. It was collapsed by aspiration, dark brown bile being withdrawn. On its medial side was a thin, atrophic but patulous segment of common duct one inch in length, which entered the duodenum posteriorly at an acute angulation. The pancreatic duct could not be demonstrated. The gallbladder and cystic duct were also tense and were slightly dilated. The hepatic duct was normal, and the liver was normal in size and consistency.

Because of the patient's grave condition and the fear of ascending infection, it was thought best to drain the enlarged portion of the common duct at this time, in order to allow it to atrophy, and anastomose the gallbladder to the transverse portion of the duodenum.

For several days following operation the child improved rapidly; her normal appetite returned, drainage from the tube became clear and yellow, and the stools light brown. On the tenth day, however, she began to vomit easily and

would take no food voluntarily; bile ceased to appear in the stools, her temperature rose and vacillated between 100 and 103 degrees, and her condition steadily grew worse. Twenty days postoperatively the sinus into the common duct was closed, but the stools still showed no evidence of bile, and she failed to improve under infusions of glucose and saline, and blood transfusion.

Twenty-five days after the primary operation, under local anesthesia, the abdomen was reopened through the scar. It was necessary to break up dense adhesions about the operative field in order to expose the structures. No infection was present. The cholecystoduodenostomy was separated and a choledochoduodenostomy done; a catheter was sutured into the gallbladder for drainage and a cigaret tube placed into the field of operation.
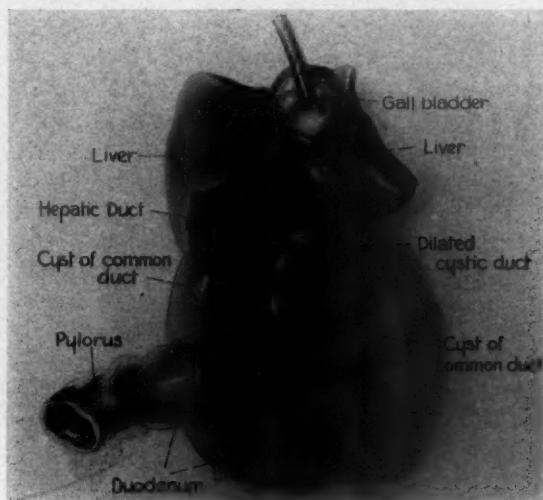

Fig. 3. Posterior view of cystic enlargement.

The day following this procedure the patient ceased to vomit, her pulse became stronger, and her general condition was better. On the second day she suddenly and quietly died.

The specimen removed at autopsy consisted of the pyloric end of the stomach, the duodenum, a section of the liver with the gallbladder attached, and the cystic enlargement of the common duct. It was evident that the condition was a true idiopathic dilatation, no doubt present at birth, which, as its size increased, drew the duct downward, causing angulation and obstruction.

COMMENT

The correct diagnosis of cyst of the common bile duct is made in an extremely small percentage of cases, chiefly, perhaps, because it is seen so seldom as to be disregarded as a probability. Judd and Greene observed it only once in 17,381 operations on the bile ducts.

Echinococcus cyst, neoplasm, or pancreatic cyst are the most common diagnoses, although it is also confused with polycystic kidney, mesenteric cyst, common duct stone, cholecystitis, catarrhal jaundice, and a few other pathologic conditions.

The principal physical signs are jaundice and palpable tumor. Pain is a symptom in a large percentage of cases, and in a few, fever, weakness, and lassitude are present. Not all of these are necessarily coincident manifestations, however, nor are they always constant in severity and duration; rather, they tend to occur intermittently. Occasionally, as in the case described here, there is no history of a previous attack.

The wide variation in age incidence, the indefinite clinical picture, and the rare occurrence of this anomaly may each be said to play a part in the errors in its diagnosis. Because of this difficulty of diagnosis, its existence probably has been unrecognized in a number of instances. Therefore, in all cases of right upper abdominal tumor, particularly in children, the possibility of a choledochus cyst should be borne in mind. We now have the Graham-Cole method of cholecystography, which has been made popular since this experience, and which should make the diagnosis simple. If another such case should come under our observation, a reconstruction of the common duct would be done primarily by a choledochoduodenostomy, as we believe the preservation of the normal anatomic relations with the required amount of secretions for normal health and life give a better chance of a prompt recovery and lessen the mortality.

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CLINICAL STUDY OF 2,288 CASES OF APPENDICITIS

At the Anderson County Hospital 1923-1934 Inclusive

J. R. YOUNG, M. D.

Anderson, S. C.

THIS study represents the experience of an average country hospital in handling the appendicitis problem over a twelve year period. The patients were treated by some fifty physicians and were operated upon by a dozen surgeons. The Anderson County Hospital is a general hospital of 85 beds, serving a population of about 100,000, of whom about 70,000 are white and about 30,000 are colored. During this twelve year period, 2,282 patients were operated upon for appendicitis. This is by far the most common disease requiring abdominal operation in youth and young adult life and in this period it causes four times as many deaths as cancer. It ranks next to cancer among the surgical diseases as a cause of death for all ages. Last year, according to Ochsner, one person in the United States died every twenty-nine minutes from appendicitis. In the 158 general hospitals in the Carolinas, 16,400 patients had their appendix removed in 1934.

Patients having appendicitis represented slightly over 10 per cent of the patients admitted to the Anderson County Hospital during this twelve year period, and operations for appendicitis constituted slightly over 18 per cent of all operations performed. Appendectomies done during the course of other operations are not included in this study. The 2,288 cases of appendicitis in twelve years represents roughly an average of 200 a year. This would indicate the incidence of appendicitis in our county as about 0.2 per cent or 1 in 500 for all ages. The highest seasonal incidence of appendicitis was found to be in the summer months, June, July, and August, and the lowest incidence in December and January. (See Table 1.)

HISTORIES

The following pertinent facts were obtained from the histories: 436 had had recent tonsilitis or respiratory infection; 824 had had previous attacks of abdominal pain; 320 gave a history of recurrent digestive disturbance; 2,220 complained of abdominal pain; 1,671 had pain localized in the right lower quadrant; 1,512 had nausea and vomiting; 300, or 17 per cent, of the acute cases had had one or more laxatives following onset of pain; 523 had some degree of abdominal distention; 1,515 had tenderness and rigidity in the right lower quadrant; 346 had generalized tenderness and rigidity.

It was further found that: 346 patients, or 15 per cent, were admitted to the hospital within 12 hours after the onset of symp-

toms; 629, or 28 per cent, were admitted 12 to 24 hours after onset; 365, or 16 per cent, were admitted 24 to 48 hours after onset; 83, or 3 per cent, were admitted 48 to 72 hours after onset; and 849, or 38 per cent, were admitted after the third day. Included in this latter figure are 548 cases of chronic recurrent appendicitis. This leaves 301, or 17 per cent, of the acute cases admitted after the third day.

TABLE 1

ADMISSION OF CASES OF APPENDICITIS BY MONTHS, 1923-1934

	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	Total No.	Per Cent
January ...	12	10	13	12	15	9	20	13	15	14	19	11	163	6.3
February ..	10	19	11	20	13	16	13	16	13	20	16	19	186	7.3
March	16	18	16	16	15	15	21	23	20	15	22	19	216	8.5
April	14	14	19	13	22	15	23	17	22	18	22	22	221	8.6
May	8	18	11	13	17	15	18	22	23	12	26	34	217	8.5
June	19	11	21	23	22	21	32	30	24	14	31	31	279	11.0
July	15	18	17	21	16	20	20	26	24	21	20	35	253	9.9
August	10	11	10	14	25	23	21	27	27	22	25	31	246	9.7
September .	9	19	13	14	12	17	28	30	24	18	20	27	240	9.8
October ...	13	13	10	19	12	18	18	14	15	17	20	13	184	7.3
November ..	6	14	14	10	14	20	18	19	12	16	11	19	173	6.9
December ..	15	7	8	17	7	28	14	17	20	11	13	10	167	6.4
	147	173	163	192	190	217	256	254	239	198	245	271		

These data compiled from the operating room ledger inadvertently included some cases in which the appendix was removed during operation for other causes. Presumably, this error does not affect facts of seasonal incidence throughout the table.

AVERAGE STAY IN HOSPITAL

The average stay in the hospital for the acute, unruptured cases was 10 days, for the acute ruptured cases 16 days, for the chronic cases 9 days—giving an average of 11.2 days in the hospital.

INCISION

A modified Battle incision was the one most frequently used. Modification consisted of McBurney incision through skin and fascia of external oblique and of the typical Battle incision through the deeper structures. This combination, McBurney-Battle, incision is more "elastic" than the McBurney incision and anatomically, is more lateral than the Battle incision. In acute appendicitis especially, we consider "the side door approach" very important.

MORTALITY

In this series there were 1,346 cases of acute unruptured appendicitis with 20 deaths, a mortality rate of 1.5 per cent; 388 cases of acute ruptured appendicitis with 49 deaths, a mortality rate of 12.6 per cent; 584 cases of chronic recurrent appendicitis with 2 deaths, or a mortality rate of .36 per cent; a general mortality rate

in 2,282 operative cases of 3.2 per cent. Not included in this figure
are 6 deaths of patients admitted in extremis with generalized peri-
tonitis who were not operated upon. These deaths increased the
mortality rate of all cases of appendicitis to 3.8 per cent. (See
Table 2.)

TABLE 2

	No.	Deaths	Mortality Per Cent
A. All acute	1734	69	4.0
1. Acute unruptured	1346	20	1.5
2. Acute ruptured	388	49	12.6
B. Chronic	548	2	.36
C. General mortality	2282	71	3.2
D. Patients admitted in extremis, generalized peritonitis (Not operated upon)	6	6	100
E. General mortality in all cases..			3.4

In this series there were 982 males, or an incidence of 43 per
cent in which there occurred 58 deaths, and 1,304 females, or 57
per cent of the total, with 19 deaths. Of the total number of cases
admitted 2,082, or 91 per cent, were whites in which there occurred
64 deaths, a mortality rate of 3.07 per cent. The proportion of
whites to negroes in our section is about 3 to 1, but the proportion
of appendicitis in whites to negroes in our section is about 10 to 1.
(See Table 3.)

TABLE 3

MORTALITY IN RELATION TO SEX AND RACE

		Percentage of Total Admissions	Deaths	Percentage of Total Deaths
Males	982	43	58	75
Females	1304	57	19	25
Negroes	206	9	13	17
Whites	2082	91	64	83

The findings in this study coincide with the findings of similar
studies in that acute appendicitis is a disease of adolescence and
early adult life. The incidence and mortality in relation to age are
given in Table 4.

TABLE 4

MORTALITY IN RELATION TO AGE

Age	No.	Percentage of Total Admissions	Deaths	Percentage of Total Deaths
1 to 9.................	69	3	6	9
10 to 19.................	799	35	23	30
20 to 29.................	891	39	9	14
30 to 39.................	250	11	10	14
40 to 49.................	136	6	12	16
50 to 59.................	92	4	7	10
60 to 80.................	46	2	4	6
	2282	100	71	100

This does not include six cases admitted in extremis on whom operation was not done.

TABLE 5

MORTALITY IN RELATION TO ANESTHESIA

	Per Cent	Deaths	Mortality Per Cent
Ether	1365	60	38	54.0
Spinal	676	30	19	26.5
Gas and ether	150	6.5	8	11.1
Novocain	91	4	6	8.4

There were no anesthetic deaths in this series. The anesthetic used seemed not to be concerned in the mortality.

Of the acute cases 300, or 17 per cent, took at least one dose of a laxative medicine after the onset of pain, and while the general mortality of all acute cases was only 4.3 per cent, the mortality in the 300 purged acute cases was 12 per cent and of the fatal ruptured cases 83 per cent had been purged.

There were 388 ruptured cases, 55 of which were treated conservatively: 49 of these patients developed localized abscesses with one death, a mortality rate of 2 per cent. The 6 other patients died of generalized peritonitis without being operated upon, giving a mortality of 12.7 per cent chargeable to the conservative treatment of ruptured appendicitis. During the ten year period of 1923 to 1932, 24 per cent of the total acute cases were admitted after the organ had ruptured with a mortality rate of 13 per cent. Whereas, in the two year period of 1933 to 1934 only 16 per cent of the total acute cases were admitted after rupture and the mortality rate has correspondingly been reduced to 9.09 per cent, which is evidence that much more public education is needed if we hope to reduce our mortality rate to a very low point.

ANESTHESIA

There were no anesthetic deaths in this series and the anesthesia used seemed not to affect the mortality. The relation of the mortality to anesthesia is given in Table 5.

We have analyzed the causes of death in the 77 cases of fatal appendicitis with the following results: (See Table 6.)

TABLE 6

CAUSE OF DEATH IN THE SEVENTY-SEVEN FATAL CASES OF APPENDICITIS

	No.
General Peritonitis	63
Bacteremia	5
Pneumonia	6
Pulmonary Embolism	1
Mesenteric Thrombosis	1
Coronary Thrombosis	1

TABLE 7

MORTALITY FOR 1935

	No.	Deaths	Mortality Per Cent
A. All acute	285	7	2.4
1. Acute unruptured	222	2	.9
2. Acute ruptured	63	5	7.9
B. Chronic	47	0	0.0
C. General mortality	332	7	2.1

CAUSE OF DEATH

Sixty-three (81.5 per cent) of the deaths were due to peritonitis. These 63 cases include 15 in whom the cause of death was placed on the chart as septic or toxic ileus or postoperative obstruction complicating peritonitis. The average time from onset to operation in this group was 61 hours. Fourteen (22 per cent) of these 63 patients were not drained at operation, having only a mild local peritonitis. In most instances this local peritonitis developed into a fatal general peritonitis because it was appraised too lightly. If every case of local peritonitis had been treated as potential general peritonitis, probably most of these 14 patients would not have died. During the past two years considerable progress has been made in this respect; our mortality in ruptured appendicitis having been reduced from the previous ten year average of 13 per cent to 9 per cent. This has come about because of: (1) a stricter handling of local peritonitis and (2) an improved handling of general peritonitis. Since we have been using an indwelling duodenal tube in

cases of peritonitis, we have seen patients recover that we feel sure would otherwise have died.

Six (8 per cent) of the 77 deaths were due to pneumonia. Of these 6 cases, 3 were frank lobar pneumonias developing suddenly when the patient had become well-nigh afebrile. The other 3 were terminal pneumonias developing in very septic patients. Respiratory infections follow operations in 10-20 per cent of cases. This complication apparently can not be prevented. Fatal infections of this type may be reduced in proportion as septic and toxic ileus is reduced.

TABLE 8

MORTALITY IN PER CENT

	1923-32	1933-34	1935
General mortality	3.6	2.58	2.1
Acute unruptured	1.4		
Acute ruptured	13.0	9.09	7.9
All acute	4.3		2.4

TABLE 9

MORTALITY FOR 1923-1935

	No.		Deaths	Mortality Per Cent
A. All acute	2024		82	4.05
1. Acute unruptured		1568	22	1.4
2. Acute ruptured		456	54	11.9
B. Chronic	596		2	.33
C. General mortality	2620		84	3.2

(This does include six cases admitted in extremis which were not operated upon.)

Five (6.5 per cent) of these deaths were due to septicemia. These were all patients having a fulminating type of appendicitis characterized by severe initial pain, chill, and the general appearance of being sicker than the average patient with appendicitis. At operation a gangrenous appendix was invariably found with comparatively little pus, and positive blood stream infection was demonstrated. All five of these patients were admitted 24 hours or more after onset of illness and all had been given morphine. Very early operation in fulminating cases appears to be the only preventive of septicemia.

Of these deaths 3 (4 per cent) were due to vascular accidents. This hazard of surgery lurks in the background. Victims of such accidents may be decreased by selecting with extreme care for opera-

tions of election patients who have a narrow cardiovascular reserve. One of these 3 fatal cases was a man of 54, operated upon for subacute appendicitis. He had a moderate degree of arteriosclerosis with hypertension. He died of coronary thrombosis on the third day.

To show that institutional study of appendicitis can be instrumental in reducing mortality, the data for 1935 for the Anderson County Hospital is here presented and compared with the ten year period of 1923-1932 and the two year period 1933-1934. (See Tables 7, 8 and 9.)

SUMMARY

The appendicitis problem in any community is larger than any one surgeon. As long as one-fourth of the patients with acute appendicitis arrive in the hospital with a ruptured appendix, the mortality will remain too high. As long as individual surgeons subject patients having a narrow margin of safety to operations of election, as for instance for chronic appendicitis, our mortality will remain too high. When an organized medical unit such as the county medical society, using the facilities of the county hospital, seriously attacks this problem from an institutional standpoint, we may expect a steady improvement in our mortality. Such attack would include a careful appraisal of the service now rendered followed by serious and sustained effort to strengthen the weak points in this service. Perhaps in all hospitals it would be found that results would be better if referring doctors would bring their patients in earlier. However, in practically all hospitals it would be found that the vast majority of neglected cases of appendicitis are brought in late because a physician was not called in until various purgatives had been given "to act on the liver." The leaven of education against this practice which the hospital associations, the boards of health, and medical societies in the Carolinas have been carrying on is already bearing fruit—but the crop is still slim. Osler said that this practice of taking purgatives was not a mere custom but was a hereditary racial trait transmitted through the protoplasm of successive generations. Besides these educational measures, a unified institutional attack of this problem would include:

A. Frank staff discussion of all fatal cases.

B. Staff discussion of successful methods of handling serious cases, thus acquainting all surgeons with successful methods.

C. Providing for easy and competent consultations.

D. Securing the enthusiastic support of the entire hospital personnel. Every surgeon has seen a patient with peritonitis recover because of superior nursing.

COMMON SURGICAL CONDITIONS OF THE CHEST

With Case Reports

RUSSELL O. LYDAY, M. D.

Greensboro, N. C.

CHEST conditions, the surgical treatment of which I shall discuss briefly, are:

1. Empyema:
   a. Acute Empyema,
   b. Chronic Empyema;
2. Lung Abscess;
3. Pulmonary Tuberculosis;
4. Bronchial Fistula.

ACUTE EMPYEMA

This condition occurs almost twice as frequently in children as in adults. As is well known, the frequency of this disease varies from year to year, apparently being influenced by a change in type or virulence of the causative organisms in current respiratory infections. The pneumococcus, streptococcus and staphylococcus are the most common organisms found in this condition. Graham says that the tubercle bacillus occurs in from 5 to 10 per cent of all cases seen in civil practice.

For the general surgeon who has no special equipment or specially-trained nursing staff, I am convinced that Graham's plan of treatment of acute empyema, which is the utilization of simple procedures and simple methods of drainage, is far more satisfactory in lowering the morbidity and mortality than attempting to use complicated forms of apparatus which have been devised and used by some thoracic surgeons. Needless to say, everyone is aware of the dangers of open operation in the streptococcal types of infection in which thin, watery pus is present before a localized abscess has formed or in the formative period of any empyema. When thick pus has formed and the patient's general condition permits, open drainage with rib resection usually gives the most satisfactory results.

In cases where the lung remains almost or completely collapsed following thorough drainage of the pleural cavity I believe that some form of closed drainage should be instituted with the hope that expansion will be encouraged. It is the feeling of some men, however, that negative pressure within the pleural cavity and increased pressure within the lungs as produced by blowing balloons, etc., have very little to do with expansion of these collapsed lungs,

the most important factor in bringing about expansion, according
to Graham, being a gradual pulling out of the lung by contraction
of adhesions formed between the visceral and parietal pleurae.
From my limited experience, I believe that closed drainage is of
great value especially in the treatment of the earlier stages where
the lung has shown no attempt to expand following repeated aspira-
tions or when this same picture is seen following open operation
with rib resection. Irrigations, especially with Dakin's solution, are
withheld for some time after drainage has been established.

Fig. 1. Roentgenogram showing cavity in the pleural space after drainage and irriga-
tions over a period of many months. (Case 1.)

CHRONIC EMPYEMA

The establishment of free drainage, removal of foreign bodies
and irrigations with Dakin's solution should be the first steps in
handling these cases. If the cavity fails to show evidence of oblit-
eration in a few weeks under this method of treatment, more radical
procedures, such as thoracoplasty, removal of the thickened parietal
pleura or even decortication of the lung, may be necessary.

CASE 1. Mrs. J., aged 33, for two years had been confined to a sanatorium
on account of tuberculosis involving the right lung. Artificial pneumothorax
treatments had been given her during that time with an apparent cure for
two years.

In November, 1927, this patient developed influenza which was followed
by a massive right-sided empyema. Empyema necessitans developed with sub-
cutaneous extravasation of pus over the right chest. She was very toxic and
extremely emaciated. When satisfactory drainage was established a large
cavity was seen extending the full length of the right chest. With irrigations
over a period of many months the cavity remained the same in size. See Fig. 1.

Anterior and posterior thoracoplasties were performed with almost oblitera-
tion of the space, but it was finally necessary to resect the thickened pleura

and suture muscle flaps from the chest wall to the collapsed lung.

This patient has remained entirely well to the present time. See Fig. 2.

LUNG ABSCESS

Acute abscesses, and many that have become chronic, may clear up spontaneously especially if they are located near the hilus. Most men feel that postural drainage and bronchoscopic drainage should be given a fair trial before resorting to surgical measures. In some cases good results have followed paralysis of the diaphragm by crushing the phrenic nerve on the affected side; in others, paralysis of the diaphragm may interfere with drainage of the abscess. Many writers have referred to this danger. I had such an unhappy experience recently.

Open drainage is usually necessary in chronic abscesses located near the periphery of the lung. Unless the visceral and parietal pleurae are densely adherent at the site chosen for drainage, the procedure must be carried out in two stages. Usually these structures will become adherent and thereby wall off the general pleural cavity if a pack is placed against the parietal pleura at the first stage of the operation.

At this point I want to emphasize the importance of resecting two or more ribs over the abscess in order that a large external opening can be made and maintained for drainage. It has been surprising to me how quickly an external opening may become closed and thereby cause extension of the process to other areas of the lung. In the literature I have read concerning operative procedures for lung abscess, very little emphasis has been placed upon the types of drains used or the necessity for a large external opening. The opening should be made to appear as a funnel with its apex in the abscess cavity, and the cavity should be packed with plain or iodoform gauze. The problem of dealing with subsequent bronchial fistulas in this type of case will be considered further on.

PULMONARY TUBERCULOSIS

The beneficial effects and curative value of artificial pneumothorax in this and other types of tuberculous involvement of the lungs cannot be fully appreciated by anyone but the chest specialist. Even though it is considered a form of surgical treatment, I am sure that we who do general surgery know very little concerning its wide field of application. A very large percentage of patients in our sanatoriums, I am told, require this treatment to put the lung at rest and help render their sputa free of tubercle bacilli.

It seems, therefore, that surgical treatment of pulmonary tuberculosis begins with artificial pneumothorax, those not responding to

this procedure being given additional surgery in the form of phren-
icectomy, pneumolysis, thoracoplasty and some of the other forms
of surgical collapse according to the indications in individual cases.
Since my experience has been limited to phrenicectomy, pneumolysis
and thoracoplasty, I shall not attempt to discuss any of the other
procedures.

With the cooperation and invaluable assistance of Dr. M. D.
Bonner of the Guilford County Sanatorium I have had an opportu-
nity to perform internal closed pneumolysis and thoracoplasties

Fig. 2. Photograph of same patient whose chest is shown in Fig. 1, eight years later.
There is no limitation of motion of the dorsal spine or upper extremities.

upon a series of patients in his institution with gratifying results.

In the cases referred to here the thoracoplasties were, of course,
preceded by attempts to obtain satisfactory artificial pneumothorax;
most of them had had phrenicectomies but none had undergone
pneumolysis. It has been observed that the combination of artificial
pneumothorax and pneumolysis has spared many patients major
thoracoplastic procedures.

CASE 2. Mrs. T., aged 33, had marked tuberculous involvement of the
left lung. A large cavity was present in the left upper lobe, while the right
lung appeared normal.

In March, 1934, posterior thoracoplasty with resection of the upper seven
ribs was performed. Unfortunately, short segments of the ribs were left pro-
jecting posteriorly. These required removal later. It was also necessary to

remove the upper three ribs anteriorly through a parasternal incision before satisfactory collapse was obtained.

Following these procedures the patient's sputum became almost nil. It has remained negative for tubercle bacilli and she is apparently well at the present time.

More recently I have employed the method used by Alexander and others in which one attempts a complete removal of the upper ribs through the posterior incision. By this method I have obtained a much better collapse than formerly secured by the Wilms-Sauerbruch type of thoracoplasty.

BRONCHIAL FISTULAS

As referred to under the heading of lung abscess, bronchopleural and broncho-cutaneous fistulas are frequent complications of this condition. A great majority of these fistulas heal spontaneously. When they fail to close early in the disease, however, and become chronic, with all the loss of elasticity of the bronchial walls that goes with chronicity, great difficulty may be experienced in closing them by any known operative procedure. If one is able to mobilize the affected lobe, cut away the scarred tissue down to the bronchus, then fold healthy lung tissue into the fistulous opening, a closure may be obtained. Again, a viable pedicled muscle flap, as described by Wangensteen, may be carried from the chest wall and sutured over the fistulous openings. This procedure is not altogether new, however, because Colonel W. L. Keller has used muscle pedicle flaps in the closure of bronchial fistulas for many years. A muscle pedicle flap may be placed into the opening and sutured there after freshening up the lining of the cavity around the fistula. Obliteration of the cavity by some thoracoplastic procedure is very important in maintaining a closure.

CASE 3. Mrs. H., aged 35, was operated upon elsewhere three years earlier for a large abscess in the left lower lobe. When seen by me in August, 1935, she had a large opening in the left lower chest. This opening communicated with an abscess cavity in the left lower lobe the size of an orange, into which were seen four openings communicating with the main bronchus.

In September, 1935, four ribs were resected in this area and the fistulas cauterized with the actual cautery. This was followed by resection of the left phrenic nerve and the accessory phrenic on this side. A few weeks later this portion of the lung was mobilized, folded in and sutured over the fistulous openings, reinforced by suturing a muscle flap from the chest wall to the lung, and enough segments of ribs resected to obliterate the space.

Prompt healing took place following these procedures, the patient having no further drainage externally and the sputum, which was copious and foul preceding the operations, practically disappeared. She has enjoyed excellent health to the present time.

CONCLUSIONS

A brief consideration of some of the commoner surgical conditions of the chest are presented from the standpoint of the general surgeon.

Three illustrative cases are presented.

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A HYDRONEPHROTIC KIDNEY CONTAINING FOUR LITERS OF URINE

G. T. TYLER, JR., M. D.

Greenville, S. C.

Mrs. F. W., aged 34, was admitted to the Greenville General Hospital, July 30, 1936, complaining of pain and swelling in the abdomen, nausea, and vomiting. The patient's general condition was good. She was thought to have an ovarian cyst the pedicle of which had been twisted. The only note of special interest in the examination was that the right kidney was palpable and large. The white cell count was not increased: temperature 100.6 F., pulse 120, respiration 24. Catheter specimen of urine showed: albumin 2, pus 1, and an occasional blood cell. She was put to bed for observation. On the 31st, the white cell count was 23,800, hemoglobin 104 per cent. When I saw her about noon, she was in great pain and had been vomiting. The thin-walled abdomen was greatly distended and tender on palpation. Her temperature at this time was 99 F., pulse 108, respiration 24. Immediate operation was decided upon. Examination of the pelvis under anesthesia was negative. Through a midline incision, a mass appeared, tense but fluctuant. It was entirely retroperitoneal, and somewhat irregular in outline. There was no pedicle. The color was normal. The intestines were crowded into the pelvis and flanks: the cecum was full of doughy contents. The uterus, tubes, and ovaries were apparently normal.

By aspiration, 2 liters of cloudy fluid were removed. It had an odor suggestive of urine, which made us think of a solitary cyst of the kidney. The peritoneum could be stripped easily from the anterior surface of the mass; but on the sides the blood vessels were large, and bled easily. The tumor extended well up into the left kidney region. Dissection proceeded slowly until another 2 liters of fluid were removed. After this the mass could be handled with greater ease. The pancreas was stripped from it and finally the tumor could be delivered. By this time we felt we were dealing with the left kidney. The right kidney was palpated, and found to be somewhat enlarged but otherwise apparently normal; as was also the right ureter. The left ureter was divided, the large vessels of the pedicle clamped, and the tumor removed. One vessel I could not identify. Its ligature of chromic catgut was left long to be brought out through the abdominal wall. (Should reoperation be necessary, I would enter through the flank, and this ligature would guide me). Since the bed of the wound was dry, the posterior peritoneum was closed with the edges inverted; then the anterior abdominal wall. The long ligature, previously mentioned, was anchored at the skin edge to a piece of rubber tubing.

The patient stood the operation well. Stimulation and abundant fluids tided her over a stormy 48 hours; thereafter her convalescence was smooth. She was catheterized 8 hours after operation, 275 c.c. of urine being obtained. Examination of this specimen revealed nothing unusual. Apparently the right kidney alone had been functioning for some months. The condition of the patient 24 hours after operation was favorable—no apparent loss of blood, no tumor in the left flank; hence the long ligature anchored to the abdominal wall was divided, and allowed to retract into the abdomen. Examinations made later during convalescence, showed Wassermann and Kahn reactions negative. On August 7, 8 days after operation, the nonprotein nitrogen was 36.6. The

patient was discharged on the 14th, in excellent condition, the wound entirely healed. Two weeks later she returned for examination, and was found to be steadily improving. In January, 1937, the visiting nurse called at the home of this patient. Her family reported that she was well, and working in a cotton mill.

Pathologist's report: Some evidence of kidney structure remaining in the mass; the wall of the kidney pelvis is thickened.

History of patient obtained after operation: Pain and swelling had been noted in the abdomen 6 years ago. The swelling began on the left side and gradually increased. Two months before admission she had begun to experience burning on voiding. Four days before admission there had been a sudden pain in the back and in the left kidney region. It was severe enough to confine her to bed. Two days later she had become nauseated and had vomited at intervals.

Her husband stated that the patient had been told for some years that she had an ailment requiring hospitalization and probably operation, but that she persistently refused this advice in spite of several attacks of pain, nausea, and vomiting.

The unusual capacity of this kidney pelvis—4 liters—and the emergency operation under the mistaken diagnosis of ovarian cyst with twisted pedicle, make this case of interest.

FIBROMA OF THE OVARY

M. Lyon Stadiem, M. D., F.A.C.S.

New Orleans

THERE appear in the literature many essays on fibroma of the ovary. Perhaps the first to describe this condition was Astruc, in 1740; then Baillie, in 1799; Kiwisch, in 1845; and, in 1873, Olhausen, who reported 6 cases found in 293 tumors of the ovary. Leopold in 1876 recorded 59 cases collected in literature but his list was incomplete as he overlooked three tumors reported by S. Wilks in the Transactions of the Pathological Society of London, 1858, as well as others reported by Spencer Wells. Coe in 1882 added 20, two of which were personal cases, and wrote a lengthy, logical treatise on this subject which even today cannot be much improved. Continuing the enumeration, Wells in 1884 had 3 cases in 1,200 ovariotomies and Briggs in 1887 reported 8 cases with an analysis of the clinical findings. Doran in 1896 also reported 11 cases. Brothers in 1900 reported 18 cases. In 1902 Peterson in a critical review of the literature, gathered 82 cases including two of his own. The same year Fairbain discussed the pathologic anatomy and classified them into three groups using 5 cases as a basis for his premise. Orthman in 1904 had 10 in a series of 527 ovarian tumors; Basso in 1905 reviewed 4 cases in Leopold's laboratory. Stewart in 1908 reported a case in which the ovarian fibroma obstructed delivery and after being displaced to allow parturition, was removed six weeks later by laparotomy; Danforth had a similar case in 1913. Fullerton in 1914 collected 6 cases in 4,500 pathologic specimens. Hellman gave a most complete essay in 1915 on 6 cases collected at the Frauenklinik of Koenigliche Charite in 10 years. Reel in 1917 reported 5 cases. In 1923 the youngest patient on record (12 years of age) was cited by Owen. Hoon in 1923 reported 55 cases unassociated with any other condition in 4,175 ovarian tumors.

This enumeration will serve to show that the subject has always been a live one, yet little is recorded in text-books about it. The frequency of ovarian fibroma has been placed at 2 per cent and in the largest series emanating from one clinic they have a standing of 3.5 per cent. At the Charity Hospital in New Orleans since 1906 there have been 24 cases in 1,320 unassociated ovarian tumors, an incidence of about 2 per cent.

ETIOLOGY

This is a much debated subject. Aschoff, Scanzoni, Rokitansky, Kroemer, Koebule, Kirwisch, Schauta, Pfannensteil and Hellman

have advanced individual theories, but they all agree that the tumor
being a connective tissue growth arises from connective tissue in
the stroma, corpus luteum, corpora fibrosa, in organized blood clots,
in the capsule or walls of blood vessels. Brothers in 1897 incised
the posterior vaginal fornix and packed a right ovarian tumor; six
years later he operated on the same patient and found a right ova-
rian fibroma. Thus he drew the conclusion that they arose from
hemorrhage of the ovary. Hellman is of the opinion that inflam-
mation, whether mechanical (hemorrhage or hyperemia), bacterial
(following infections), or cirrhotic (from retrograde changes at

Fig. 1. Stroma of myxomatous degeneration in a fibroma simulating cystadenoma.

the menopause), may be an etiologic factor and concludes that the
etiology is "obscure and unsettled." The tumor has not been de-
scribed before puberty. Owen in his case of a 12 year old girl
unfortunately did not state that she had reached the menarche.
Could there not, therefore, be some inter-relationship between pitui-
tary control of connective tissue growth in the ovary and fibroma
of the ovary? Witherspoon recently cited a series of fibroid tumors
of the uterus and correlated a pituitary factor in their etiology.
This wave of endocrine therapy to stimulate the graafian follicle
and corpus luteum may confirm this premise; fibroma will possibly
become frequent.

The following is a concise table of the age incidence, multiparity, symptoms, color, provisional diagnosis, menstrual history, result and operation:

Age incidence:

White—		Colored—	
20-30 years	1	15-20 years	2
30-40 years	1	20-30 years	2
40-50 years	5	30-40 years	3
50-60 years	1	40-50 years	6
60-70 years	2	50-60 years	1

Marital history:

White—		Colored—	
Multipara	7	Multipara	7
Nullipara	3	Nullipara	7

Menstrual history:

White—		Colored—	
Menopause	4	Menopause	2
Normal	3	Normal	7
Menorrhagia	1	Menorrhagia	2
Dysmenorrhea	1	Dysmenorrhea	2
Amenorrhea	0	Amenorrhea	1
Oligomenorrhea	1		

Symptoms:

Swelling of abdomen	4	Bleeding	2
Mass in lower right side.....	1	Pain in abdomen	14
Dysuria	1	Amenorrhea	2
Tumor in abdomen	6		

Operations:

Right salpingo-oophorectomy	4
Supra-vaginal hysterectomy (salpingo-oophorectomy, right or left)	4
Supra-vaginal hysterectomy (bilateral salpingo-oophorectomy)....	6
Pan-hysterectomy (bilateral salpingo-oophorectomy)	1
Right oophorectomy	4
Left oophorectomy	2
Bilateral oophorectomy	1
Left salpingo-oophorectomy	2

Anesthetic:

Ether	16	Spinal	8

In elaborating other clinical points our findings will be compared under each heading.

AGE

The age incidence varies. The youngest patient reported in the literature was 12, while the oldest was 73. Patients in this series were from 18 to 63 years of age. In both the white and the colored

group the greatest number occurred in the fifth decade of life. They are not found in young women more often than uterine fibromyomas as Peterson stated.

MENSES

As a rule the menses are not much affected and in this instance normal menses were predominant, being present in 7 colored and 3 white patients, while the menopause came next with 2 and 4 respectively. Dysmenorrhea, menorrhea and oligomenorrhea occurred, but not frequently enough to be of diagnostic significance.

Fig. 2. Fibroma of the ovary.

PARITY

There were 7 white multiparas and an equal number of colored, while among the nullipara the colored numbered 7 and the whites 3.

ASCITES

Much has been said concerning ascites in ovarian fibroma. Olhausen is of the opinion that it is mechanical, while Pfannenstiel thinks it chemical. Schauta clings to the theory of hyperemia; Schatzschen, to that of secretion from a degenerating tumor. In this series ascites was present 5 times at operation. However, ascites is said to occur in 20 per cent of the cases. There are, of course, other conditions (tuberculous peritonitis, cirrhosis of liver, nephrosis, carcinoma of ovary, etc.) which are to be excluded in the presence of ascites. A tumor with twisted pedicle was encountered twice but there was no co-existing ascites.

Symptoms

Pain is the symptom most frequently recorded in the literature and our cases confirm this. Pelvic pain occurred 14 times, while swelling of the abdomen was the chief complaint in 7 cases. Amenorrhea, vaginal bleeding and dysuria was the cause of admission in two instances each. Pressure of the tumor on any organ would cause pain in the region of pressure or in a distant point by pressure on a nerve trunk. The duration of symptoms varied from five weeks to ten years with three cases each in the five year group and the six month group.

Diagnosis

The preoperative diagnoses were:

Multiple uterine fibroids	14
Pedunculated fibroid	3
Ectopic pregnancy	1
Right ovarian tumor	2
Cystic ovary	1
Dermoid cyst	1
Bilateral salpingitis	1
Chronic pelvic inflammatory disease	1

There is no single diagnostic feature accorded these tumors. They are to be differentiated from pedunculated fibroids of the uterus, solid carcinoma of the ovary, sarcomas of the ovary, tumors of the tube, indeed any solid tumor in the region of the adnexa. According to Sheffery, sarcoma of the ovary in 60 per cent of cases occurs before the age of 14 and sarcoma forms about 4 per cent of all tumors of the ovary and from 5 to 14 per cent of the malignant tumors of the ovary. One should remember that fibromas may undergo sarcomatous degeneration. Rohdenburg found 23 ovarian fibromas in 500 ovarian tumors (4.6 per cent) and 1 case was undergoing sarcomatous degeneration. In the same series there were 15 sarcomas, an incidence of 3 per cent. Caylor and Masson report 4 cases of ovarian fibroma undergoing sarcomatous degeneration and point out that sarcoma occurring in a fibroma is not as malignant as pure sarcoma. There was no evidence of metastasis in one of their patients who died postoperatively. Solid carcinoma of the ovary usually shows evidence of metastasis. Pedunculated fibroids simulating an ovarian tumor are rare, usually being multiple.

Pathology

Myoma and fibroma are considered together and where muscle tissue is present it comes from the hilum of the ovary or blood vessels.

For description the simplest classification seems to be that of Coe:

1. Hypertrophy of stroma—ovary entirely replaced by the new formation.

2. Local growth of stroma leaving part of the ovary unaf- fected, except by compression growth within tunica.

3. Pedunculated fibroma—arising from tunica albuginea.

The first type is the most common.

The tumor occurred in the right ovary 15 times and was present in the left 11 times, being bilateral in only two cases.

Grossly the tumors are hard, slightly irregular and tend to be shaped like an ovary. Their consistency varies with the amount and type of degeneration; if there is fatty, cystic or myxomatous degen- eration they are apt to be soft; on the other hand, hyaline and cal- careous degeneration would produce a hard tumor varying from fibrous to bony hardness. In some instances they may be of such a cystic nature as to be considered grossly multilocular cystadenoma. Such a case recently came under my care and a short resume of the pathologic report follows:

There was a large cystic mass measuring 22 by 14 by 8 cm., with many fibrous tags upon the surface. On section, it contained a large number of cysts filled with a clear, pearly, slightly mucoid fluid and was lined by a smooth shining membrane. An occasional cyst was filled with a brownish fluid. There were no papillations protruding from the lining of the cyst. Grossly my impression was a multilocular cystadenoma of the ovary. The final micro- scopic diagnosis was fibroma of the ovary with myxomatous degeneration. The spaces noted grossly were lined by a flattened cell, probably epithelium.

The color is dependent on the vascularity of the tumor and varies from white or yellowish-white to a brown-red; if hemorrhages into the tumor are of long standing, the color may be black. In weight they have been reported from the size of a cherry pit to 40 Kg. (Clemens). An excellent contrast is offered in a photograph pub- lished by Caylor and Masson: in this paper a fibroma is shown undergoing sarcomatous degeneration and the tissue of the sarcoma, described as light brown to tan, is contrasted with the white fibrous structure of fibroma. Cystic cell tumors also resemble fibromas in certain areas and might lead to an error of diagnosis if a microscopic section were taken from the fibromatous region.

The ultimate diagnosis must be microscopic. Quoting from Hell- man, "there must be a certain regularity of the individual fibrous or muscular cells and strands despite varying quantities of cells, fibers, vessels and degenerative changes. The fibrous cells are as a rule short and spindle-shaped. Protoplasm surrounds the nucleus

only very slightly. The nucleus is slightly bent or pointed. Fibroma is distinguished from sarcoma in its regularity and in the shape of its cells. Sarcoma-cells are rich in plasma, have nuclei of various shapes, mostly oval, and more or less mitotic figures."

No less an authority than Bland-Sutton classified ovarian fibromas as fibro-sarcomas though much less malignant than elsewhere. Coe was of the opinion that these tumors are made up of an ordinary connective tissue basis; the class to which they belong shows a higher grade of development denoted by prevalence of cellular elements than is possessed by similar tumors elsewhere in the body so that in another locality they might be called sarcoma.

Our group of cases showed hyaline, myxomatous and calcereous degeneration. There was no true bone formation in a fibroma, but I have encountered an osteoma in our pathologic specimens and there is reason to believe that this type of degeneration may occur in a fibroma. Kleinwachter and Waldeyer described bone.

TREATMENT

The treatment in all cases was surgical removal. In some cases the uterus and adnexa were also removed for concurrent disease in these organs. There was no recurrence of fibroma in the opposite ovary either in our cases or in those reported in the literature. It is, however, quite possible to expect such an occurrence, for there were two cases of bilateral ovarian fibroma. No one has reported any case treated by Roentgen-ray.

PROGNOSIS

Prognosis is excellent and operation is attended by little shock. There were no deaths in this series. Formerly recurrence was a criterion of malignancy (fibroma or sarcoma); evidently the profession did not consider that entire removal of a malignant tumor effects a cure. If fibroma is allowed to remain, there is a possibility of twisted pedicle with gangrene and peritonitis; sarcomatous degeneration is an ever present menace.

CONCLUSIONS

1. A series of 24 ovarian fibromas are reported. The symptoms, menstrual history and treatment agree with previously reported studies.

2. The prognosis is excellent.

3. The ultimate diagnosis is by microscopic study.

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MULTIPLE STAGE THYROIDECTOMY WITH PREOPERATIVE IODINE THERAPY

WILLIAM H. PRIOLEAU, M. D.

Charleston

IN great part the safety of thyroid surgery was built upon the principle of multiple stage operations in the active hyperthyroid and otherwise bad-risk cases. This consists of the ligation of one or both superior thyroid poles or the removal of only one lateral lobe at a time. The magnitude of the operation is reduced proportionately; leaving one side untouched reduces to an even greater extent the troublesome and often dangerous postoperative laryngeal and pharyngeal symptoms; there is much less danger of a so-called thyroid crisis. On account of certain uncontrollable and unpredictable factors an attempt was made to keep the operation well within bounds of what the patient could withstand. The result of these efforts was a minimum morbidity and mortality which it is likely will hardly be bettered by operative measures alone.

The use of iodine as a preoperative measure was advocated and popularized by H. S. Plummer about fifteen years ago. It brings about a partial remission of the hyperthyroidism with corresponding decrease in the heart rate, nervousness and basal metabolism. This makes the patient a safer operative risk and generally increases the magnitude of the operation he can withstand. However in a certain number of cases this added factor of safety is overestimated and a false sense of security is gained. Accordingly the complete operation is done in some cases unsuited for it. The result is an increased morbidity and mortality.

Whereas the use of iodine preoperatively has added to the safety of thyroid surgery and reduced greatly the need for multiple stage thyroidectomy, there will always be some cases which will not be fit subjects for the complete operation at one stage. In such cases the hyperthyroidism may be very severe and may not respond well to iodine therapy; the heart may be on the verge of failure even though the hyperthyroidism is not very active; there may be intercurrent disease or advanced age, both adding to the operative risk. At times technical difficulties connected with the operation may make its completion unwise. Injury to the recurrent or superior laryngeal nerve, or other untoward symptoms during the removal of the first lobe may make it advisable to defer the removal of the second.

In extremely bad-risk cases pole ligation should be done on one side only. It serves the double purpose of indicating how the patient

will react to an operative procedure, and of inducing a partial remission which will enable the patient to withstand better any subsequent operation. The removal of only one lateral lobe is proportionately much less of a procedure as regards its effect upon the patient than the complete operation. On the other hand, paradoxical as it may seem, the remission following the removal of one lobe is almost complete, resulting in remarkable improvement in the following few months. In doubt, it is much safer to remove only one lobe; at the end of 24 hours, if the patient's condition permits, the operation can be completed. Otherwise the wound is allowed to heal, the remaining lobe is removed in two or three months when its removal is attended by much less risk and reaction.

The increased number of operations in the multiple stage procedure of necessity increases certain types of risks such as anesthetic, pneumonia, wound infection, and embolism. However the safety it affords bad-risk cases in dangers peculiar to thyroid surgery far outweighs these disadvantages. It is recognized that there are economic and other advantages in completing the operation in one stage, but these must not be allowed to induce us to take risks which can be to a great extent avoided by the multiple stage procedure.

70 Hasell Street.

BENIGN TUMORS OF THE BREAST

CECIL E. NEWELL, M. D., M. S. IN SURG., F. A. C. S.

Chattanooga, Tennessee

THE object of this paper is twofold. The first is an endeavor to simplify the subject of breast tumors, and the second is to urge the removal of *every* tumor of the breast for pathologic diagnosis.

MATERIAL

In the preparation of this paper, it was thought that a study of some of the breast tumors we have removed for pathologic examination at the Newell Clinic and Hospital would be both interesting and instructive. Therefore, the last 500 consecutive specimens that I have examined microscopically were reviewed. Of this number 48 (or approximately 10 per cent) were found to be tumors of the breast. Of these 27 were benign and 21 malignant. Three that were thought to be breast tumors at operation, but were found to be normal or inflammatory breast tissue upon section, were purposely excluded.

No case of tuberculosis or abscess has been included; nor the one instance of a tumor of an accessory breast.

CLASSIFICATION

MacCarty has tabulated all of the terms of different breast tumors used in eight standard text books on pathology. His list includes a total of 146 different terms. This lack of uniformity in terminology is deplorable, and it is little wonder that the classification and nomenclature of breast tumors is generally considered to be complex, vague and almost impossible to learn. An attempt will be made to demonstrate that this is not so, and to show that tumors of the breast, as tumors elsewhere, follow certain simple orderly rules.

It will aid to recall the structure of the breast. Anatomically and histologically, the breast is composed of from fifteen to twenty clusters of milk glands embedded in a fibrous tissue stroma with a duct leading from each group of glands to the nipple. Covering the breast is connective tissue, fat and skin. Each portion may have any type of tumor which arises in that kind of tissue. By keeping this in mind, the classification of breast tumors is made easy. For instance: In the parenchyma or glandular portion of the breast, there occur only those tumors derived from glandular epithelium, namely: adenomas and cysts in the benign group, and adenocarcinoma as the malignant type. A pure adenoma of the breast is a rarity. They are more often mixed with varying amounts of fibrous

tissue, and hence are usually called fibroadenomas. Likewise, simple cysts of the breast are rare. They are more frequently associated with a certain amount of hypertrophy of the glands and fibrosis, and have been given the term, probably a misnomer, although in common usage, "chronic cystic mastitis."

Let us now proceed to the stroma, or connective tissue of the breast. There is nothing different or difficult regarding the tumors originating in these tissues. They are the same as those that arise from connective tissues in any other part of the body. The benign ones are the fibroma and lipoma, and the malignant one is the sarcoma.

Likewise, the tumors of the skin covering the breast are similar to those growths arising from skin anywhere on the surface of the body. Moles, warts, sebaceous cysts, etc., are the benign tumors, and basal cell and squamous cell carcinoma are the malignant ones.

There are several tumors peculiar to the breast, but only three of them are frequent or serious enough to deserve mentioning. These include the intraductal papilloma and the intracanalicular fibro-adenoma which grow within a milk duct, and the epithelioma of the nipple commonly known as Paget's disease.

Many true tumors of the breast not included above have been reported in the literature but they are pathologic oddities, and are of interest when found mainly because of their rarity.

SEX

Needless to say, men are rarely affected with neoplasms in the breast. In the present series of benign tumors 26 were in females and one in a male. The tumor in this case was a fibroma.

AGE

Tumors may occur in the breast at any age. The youngest in this series was a girl of 10, and the oldest was a woman of 74. Some very instructive information was gained by investigating the age of the patients with the most frequent types of tumors. For instance, the average age of women with a fibro-adenoma in this series was 22 years, while it was 43 for those with chronic cystic mastitis. It is interesting to note that in those with cancer it was 54 years.

INCIDENCE

The 48 benign and malignant tumors have been tabulated in their order of frequence. (Table 1.) I believe that, with the exception of the sarcoma and the fibroma, this represents an approximately true relative incidence of tumors of the breast. The incidence of fibroma and sarcoma of the breast is probably around 1 per cent.

The most striking thing to be noticed in Table 1 is the frequency of cancer. You will note that although benign tumors occurred more often than malignant ones, adenocarcinoma was the most frequent tumor occurring in the breast.

TABLE 1

INCIDENCE OF TUMORS OF THE BREAST
(48 consecutive cases)

Benign: 27
Chronic cystic mastitis 10
Fibroadenoma 8
Intracanalicular fibroadenoma 2
Fibroma 2
Intraductal papilloma 1
Lipoma 1
Cyst 1
Mole 1
Wart 1
Malignant: 21
Adenocarcinoma 18
Sarcoma 3

TYPES OF TUMORS

Chronic cystic mastitis (Fig. 1) is probably the most frequent benign tumor of the breast. It is limited to the female mammary gland. In the present series the average age of these patients was 43 years which corresponds with the conception that it is most prevalent during the changes incident to the menopause. Because of this, it was termed "senile involution" for many years. Chronic cystic mastitis evidences itself as a nodular enlargement of the breast. It is often multiple, or even diffuse throughout the breast; sometimes it is bilateral. When multiple tumors are found in one or both breasts, the disease is probably chronic cystic mastitis. The mass or masses are frequently painful and nearly always tender. They are usually hard but may be palpably cystic. When the glandular epithelium has hypertrophied to the extent of filling the lumen of the glands, it is often spoken of as Schimmelbusch's disease. (Fig. 2). This type of chronic cystic mastitis has long been regarded as a definite forerunner of cancer. If the cysts contain papillary projections of epithelium the pathologic process is usually termed papillary cystadenoma. This is commonly considered a precancerous stage.

The fibroadenoma is a firm, round, encapsulated, single tumor which grossly resembles the uterine fibroid. Microscopically it is composed mainly of dense fibrous tissue surrounding small glandular

elements. The average age of the patients in this series from whom a fibroadenoma was removed was 22 years. These tumors, because they are embedded in the dense tissue of the breast, frequently cannot be distinguished from cancer by palpation. Although they are distinctly benign and rarely attain large dimensions, by far the safest procedure is to remove these growths, because palpation is so unreliable in their diagnosis.
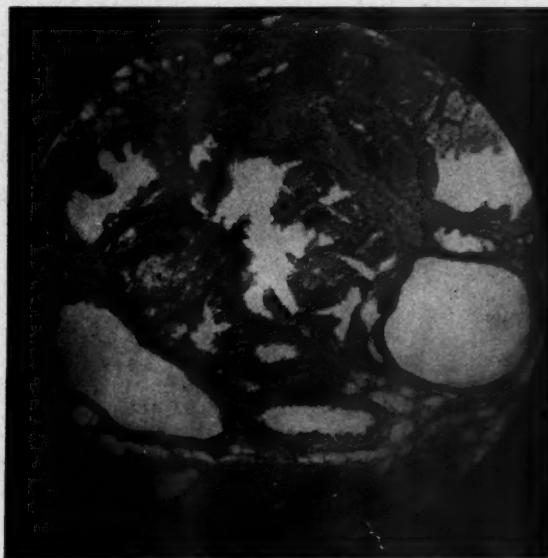
Fig. 1. Chronic cystic mastitis. Note the extensive hypertrophy of the glandular epithelium with papillary formation in some of the cysts. X 100.

The intracanalicular fibroadenoma is considered to be a fibroadenoma in which the fibrous element grows down into the duct canal. It is a queer single cauliflower tumor in an enormously dilated portion of a milk duct. When one is cut open nothing gives a similar appearance and one seen is seldom forgotten. The dilated duct looks like a shell filled with a cauliflower mass of hard white granules (Fig. 3). These granules are papillary projections composed of fibrous tissue covered by a thin layer of ductal epithelium (Fig. 4). They are about the size of particles of table salt, and are so closely packed that they are moulded to fit each other as are closely packed gallstones. These tumors are small growths and seldom become larger than 3 or 4 cm. in diameter.

A pure fibroma of the breast is rare. It is a hard tumor, usually round and composed entirely of fibrous tissue. It may be situated immediately under the skin in which case it is termed subepithelial fibrosis, or it may be a discrete tumor in the mamma. It is perfectly benign, although it possesses malignant potentialities. I have seen one fibroma of the breast develop into a fibrosarcoma.

The intraductal papilloma is usually found in one of the larger milk ducts beneath the nipple. The duct is dilated and the cavity is
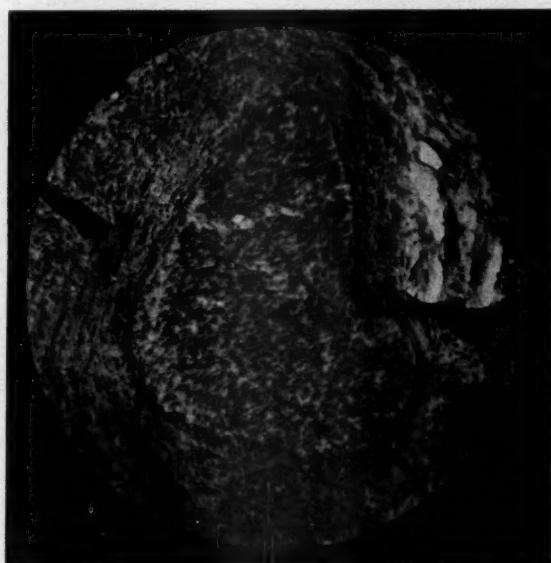
Fig. 2. Schimmelbusch's disease. Note that the hypertrophied glandular epithelium has filled the entire lumen of the gland. X 175.

filled with a pedunculated plug of tissue resembling a raspberry. This plug is composed of a papillary overgrowth of ductal epithelium somewhat resembling an adenomatous polyp. These tumors often give rise to a bloody discharge from the nipple and are considered premalignant.

Lipomas occur only occasionally in the breast. They may be either distinctly or indistinctly encapsulated. Because they are soft they are often indistinguishable from cysts. I know of no case of malignancy developing in or from a lipoma.

Moles and warts when uncomplicated look the same on the skin of the breast as elsewhere. It is only when they become irritated, inflamed, infected or ulcerated that difficulty in recognition ensues.

DIAGNOSIS

The diagnosis of a tumor of the breast is not as simple as ordinarily believed. The majority of female breasts are somewhat nodular and it is sometimes not easy to determine definitely whether a small nodule is an isolated mass of glandular tissue, or whether it is a real tumor. As mentioned above three such nodules were removed for examination, but were found to be normal or inflammatory breast tissues.

Considering the occasional difficulty in even establishing whether there is a tumor in the breast, it is easy to see why there is so much preoperative doubt in determining if a tumor in the breast is benign or malignant.
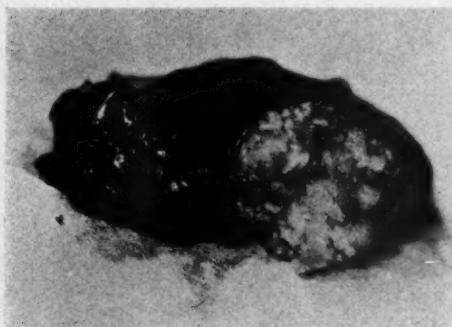
Fig. 3. Intracanalicular fibroadenoma. Note the granular appearance of its contents. 2/3 actual size.

It is needless to say that the majority of benign tumors of the breast are located by palpation. Some[2, 3] prefer to lay the hand flat on the breast and compress the gland between the hand and the chest wall. It is claimed that by this method certain deep-seated tumors may be found that would otherwise escape detection. The most natural and probably equally effective maneuver is to palpate the tumor with the index and middle fingers, or by grasping the mass between the thumb and index finger.

Of course, the most frequent lead in the finding of a tumor of the breast is the complaint or history of a lump in the breast. But, if we only examined thoroughly the mammae of those women who complain of a mass in the breast, then we have sorely neglected the remainder of our female patients. Careful palpation of the breasts, as a routine in every physical examination of women, cannot be overemphasized. It is often omitted because the complaint and history definitely point to pathology remote from the breast. But this is not

a legitimate excuse for failure to examine the breasts; it is still neglect. And until we learn this many women will lose their lives unnecessarily.

Pain in the breast, discharge from the nipple, dimpling of the skin, the so-called "pig-skin" or "orange peel" skin caused by the attachment of the skin to a growth beneath, all aid in the diagnosis of breast tumors.
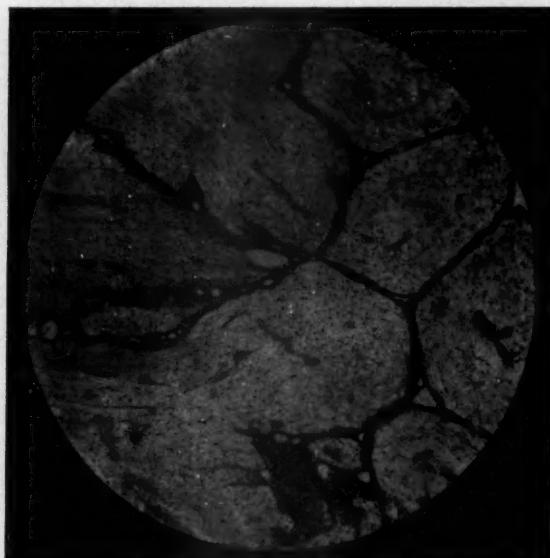

Fig. 4. Intracanalicular fibroadenoma. Note the thin layers of epithelium covering the papillary projections, and how closely packed they are, even under the microscope. X 100.

TREATMENT

Unless a tumor of the breast is unmistakably malignant, the *one* and *only* treatment is surgical removal of the growth *and* pathologic examination of the tissue. The excision is best carried out through a radial incision. Local anesthesia is thoroughly satisfactory. There is no contraindication in using a knife, although theoretically the electric cautery has the advantage of killing any cells in its path and sealing the blood and lymph vessels should the neoplasm prove malignant. If facilities permit, the immediate examination of the tissue by frozen section is preferable. If this service is not available, the next best procedure is to fix the specimen in 10 per cent formaldehyde, and have it examined by the nearest competent pathologist.

In some instances, especially in the very hypertrophied type of diffuse chronic cystic mastitis, it is wise to do a simple amputation of the breast, and thereby definitely prevent the possibility of the development of malignancy. I performed this operation once in the present series. The glandular epithelium were very hypertrophic with papillary formation, the woman was 47 years old, and her peace of mind and assurance of future life were more important to her than her breast.

PROGNOSIS

The prognosis in case of a benign tumor of the breast is best when the tumor is in a specimen bottle.

What has recently given me the most encouragement in the advancement of medicine was reading an old Da Costa's Surgery revised in 1919. In this he stated that malignant tumors of the breast were ten times more frequent than benign tumors. This simply means that seventeen years ago ten out of every eleven breast tumors that the surgeon saw were advanced malignancy. Now, we are more alert, and women are becoming cancer conscious. I am, therefore, happy to report today that 27 out of the 48 breast tumors in this series are benign.

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THE DIRECT SURGICAL ATTACK ON DUODENAL ULCER

Fred W. Rankin, M. D., and Allen E. Grimes, M. D.

Lexington, Kentucky

DIRECT surgical attack is now generally regarded as having a very definite place in the treatment of duodenal ulcers which are intractable to medical management or complicated by obstruction, repeated hemorrhage, or perforation.

The history of gastric surgery from the time of Hippocrates, who commented on the deadliness of stomach wounds, to 1800 contained reports only of accidental rather than of intentional operations on the stomach. The present methods evolved only after painstaking investigative and clinical experience with the passage of sufficient time to evaluate the various methods.

The first research undertaken to determine the possibilities of gastric surgery was inaugurated by Geissen, who in 1810 performed experimental pylorectomy on dogs. Either his work was not remarkable or knowledge of it failed to reach interested ears, for it was sixty-six years before Gussenbaur and Winiwarter proposed a similar operation on man. It was even later—1879 or 1880—before such an operation was attempted by Pean and Rydygier. Their efforts were unsuccessful and it remained for Billroth to complete the first resection of the pylorus for cancer in 1881. He reestablished the continuity of the gastro-intestinal tract by suturing the duodenum to the cut end of the stomach as a gastroduodenostomy. This procedure has attained a place of usefulness and is now known as the Billroth-I type of gastric resection.

Nicoladoni and Wölfler, assistants in Billroth's clinic, likewise interested themselves in this problem. The former proposed gastroenterostomy the same year that Billroth did his resection, but Wölfler was the first to employ the operation with good palliative results in a case of advanced carcinoma of the pylorus. He gave the operation its name. The earlier efforts in this procedure were not always successful. There were many technical difficulties which arose to complicate the results. These were concerned chiefly with the size of the stoma, its location on the stomach wall, and the length of the jejunal loop. In 1883 Courvoisier devised a retrocolic approach in doing the anastomosis. The advantages of this modification were immediately appreciated by von Hocker, who in 1885 adopted posterior gastro-enterostomy because it eliminated regurgitant vomiting and reduced the incidence of obstruction at the

anastomosis. Billroth likewise seeing the advantages of this procedure utilized it in developing his type II gastric resection.

Loreta and Hahn represented the conservative faction who advocated simpler methods for the relief of benign strictures. In 1884 they suggested digital and instrumental dilatation rather than the more extensive surgical maneuvers. Heineke, of Germany, believing more radical measures were necessary, in 1886 performed the first plastic operation on the pylorus for benign stricture. Mikulicz, independently in 1887, and without knowledge of the antecedent work of Heineke, performed and described a similar operation which now bears the combined name of Heineke-Mikulicz pyloroplasty. This consists of a diamond-shaped incision directly over the area of the pyloric stenosis with removal of the lesion. The incision is made parallel to the long axis of the pylorus and closed in the opposite direction to give adequate lumen. The wound is sutured without consideration of the separate layers.

Koeppehn and Jaboulay, in 1889, offered the submucous pyloroplasty. This procedure was later made popular by Rammstedt in the treatment of congenital stenosis of the pylorus. It is known as his operation and by all standards remains the best procedure for the relief of this condition. Kocher in 1891 performed successfully an end-to-end gastroduodenostomy following a pylorectomy.

In 1892 Jaboulay first suggested the possibility of a lateral gastroduodenostomy. The Heineke-Mikulicz technic seemed the most popular, but was not entirely satisfactory as is evidenced by the modifications introduced in 1899 by Richardson, in 1900 by Morrison, and in 1901 by Mayo-Robson. The fundamental principles, however, were not altered.

In 1891 and 1901 Halstead was working on and described the lateral anastomosis which had previously been suggested by Jaboulay. Finney in 1902 presented his gastropyloroduodenostomy. This was the first radical departure from preceding pyloroplasties and consisted in mobilizing the pylorus and first portion of the duodenum. Three sutures were placed as retractors, one in the upper wall of the pylorus, the second in the anterior wall of the stomach, and the third in the anterior wall of the duodenum. The last two were placed approximately 12 cm. from the one in the pylorus and served to mark the lower extremity of the incision. Traction was made on the upper and lower two stay sutures which allowed the first portion of the duodenum to be approximated alongside the stomach in which position it was fixed by a continuous layer of suture. After this a posterior row of sutures was completed and an

anterior row of mattress sutures was placed but not tied. This line
of sutures was retracted vertically in each direction from the mid-
line and an incision was made in the shape of a horse shoe. It started
on the gastric side just inside the suture line and was carried upward
to the pylorus, through the pylorus and downward into the duo-
denum. The incision represented an inverted U. All the ulcer and
scar tissue as far as possible were excised on each side. A continu-
ous catgut suture was then placed through all the coats of the intes-
tine on the posterior wall. The anterior mattress sutures which
had been previously put in were tied and the operation completed
after a few Lembert sutures were used as reinforcements on the
anterior wall.

The adaptability of this operation to certain types of lesions and
to those individuals whose duodenum could easily be mobilized and
approximated alongside an accessible stomach was soon recognized.
Horsley in 1919 offered still another method. He made an incision
in the pylorus about 2.5 cm. long and carried it into the stomach side
for twice this distance. The incision was then carried through the
ulcer area on the anterior wall and through the pyloric ring. The
duodenum was incised through all its coats, but the gastric incision
included only the serosal and muscle layers. Sutures were placed
through the two ends of the incision and it was closed in the oppo-
site direction, thus converting a longitudinal line into a transverse
line. Sutures were placed through all the layers of the duodenum
but through only the serosal and muscle layers of the stomach, thus
leaving a large gastric curtain to cover the duodenum.

Probably one of the best and simplest procedures and the one
we most frequently use was introduced in 1922 by Judd. The tech-
nic consists of two elliptical incisions made through the pylorus and
duodenal bulb directed parallel to the long axis of the stomach. The
incision includes the ulcer, the duodenal cap, and approximately the
anterior one half or two thirds of the pyloric sphincter. The wound
is closed in the vertical direction starting with a running catgut
suture in the mucosa. The muscle and serosal layers are approxi-
mated separately by a Lembert suture and chromic I catgut and
reinforced occasionally by interrupted silk sutures. This procedure
was designed primarily to remove the offending lesion and the
anterior portion of the pyloric sphincter to prevent subsequent
spasm or contracture of the outlet, either of which conditions may
be productive of the old dyspeptic syndrome. The maneuver gives
in addition adequate visualization of the pylorus, antrum and the
posterior wall of the duodenum, and brings this field, which fre-
quently harbors penetrating and hemorrhagic ulcers, into the range

of surgical attack. These posterior wall lesions, comprising but 13 per cent of our cases, may be overlooked and will account for recurrent symptoms if the duodenum is not opened and explored.

In recent years in selected cases it has been our tendency to do the more conservative plastic operations for duodenal ulcer rather than resections with their higher mortality, or gastro-enterostomy with its incidence of from 2 to 6 per cent of gastrojejunal ulcer formation. Simplicity, ease of execution, high percentage of good results, and minimum risk make pyloroplasty in properly selected cases the choice over more complicated gastric operations.

From January, 1927, to January, 1936, we have operated on 298 duodenal ulcers. Of this number gastro-enterostomy was done in 212 cases, pyloroplasty in 79 and pylorectomy and gastric resection in 7 cases. In this series approximately 85 per cent of the ulcers were situated within the first inch of the duodenum and on the anterior wall. In 6.5 per cent there were associated anterior and posterior wall ulcers. In another 6.5 per cent there were posterior wall ulcers alone. In the whole group of 298 cases there were 238 males and 60 females, which fairly well coincides with the usual sex distribution of duodenal ulcers.

At the beginning of this period it was our policy to do gastro-enterostomy in the majority of cases, but in so far as the offending lesion was so often left undisturbed there not infrequently developed recurrent dyspepsia, hemorrhage, and perforation from a reactivated duodenal ulcer, not to mention the complications due to a gastrojejunal ulcer. In an effort to eliminate these complications we have turned in recent times to pyloroplasty which seems to give us as high an incidence—85 to 90 per cent—of freedom from distress without the frequency of complications of gastro-enterostomy. The risk of this operation is so slight that this alone almost justifies the operation when it can be performed. In the few cases in which the Judd type of pyloroplasty fails there still remains an opportunity for doing a gastro-enterostomy, resection or any of the other procedures since the anatomic relationships have not been distorted.

To obtain the best results from this operation there are several definite indications which must be met and a careful selection of cases must be made. The procedure is of great value in young patients having high acids, a hypertonic, high-lying stomach, and an anterior wall ulcer without obstruction. This class of patient frequently includes the hard-working, high-strung, business executive, who frequently rebels at diet and at periods of hospitalization. Occasionally, these patients will cooperate in a conscientious effort to follow a carefully designed scheme of medical treatment. The

nervous factor in these dynamic individuals is more difficult to control and because of it high acidity proves troublesome. Excision of the ulcer and pyloroplasty should by all means be done in these cases even though at times it may be made difficult by a duodenum which is not easily mobilized. Gastro-enterostomy in these cases too frequently is followed by stomal ulcer probably because of the patient's continued inability to control the nervous factor.

Pyloroplasty is frequently indicated where hemorrhage has been an outstanding symptom. Under such circumstances the importance of visualization and direct attack on the posterior wall which so often harbors hemorrhagic lesions cannot be over-emphasized. By removing the lesion which is made accessible by this type of approach, prospects of immediate relief are great and protection against recurrent hemorrhage is often assured. The association of posterior and anterior wall ulcers is so frequent that in every case in which hemorrhage has been a factor, removal of the anterior ulcer or gastro-enterostomy without visualization of the posterior wall will often lead to disappointing results.

There is a small percentage of cases which, in spite of careful adherence to an adequate medical regime, prove intractable. In the treatment of these patients attention has been directed toward the control of the abnormal psychic and nervous stimuli by adjustments in environment and mild sedatives; toward elimination of irritants by a modified diet consisting as a rule of bland and soft foods; toward the reduction of hyperacidity; and by the use of various alkaline powders and the administration of mucilaginous substances to retard acid formation; however, dyspeptic distress sometimes persists. These patients after having had repeated medical attempts at cure usually insist on surgery and pyloroplasty will frequently afford the expected relief. Occasionally these intractable cases, because of repeated exacerbations which result in contracture, obstruction, and penetration with fixation to adjacent tissues, cannot be alleviated by pyloroplasty but gastric resection is necessary.

Occasionally one encounters a patient with a dyspeptic history characteristic of duodenal ulcer with but slight elevation in gastric acids, and negative roentgenologic findings. These cases prove troublesome if the symptoms fail to respond to the usual medical treatment. Finally, because of the patient's insistence and demand for relief, one is forced into an exploratory operation. The findings are often startling—on examination the anterior wall frequently presents little evidence of an ulcer, and on palpation there appears to be no lesion posteriorly. In many such cases, however, if the duodenum is opened as in pyloroplasty, a perforating ulcer is found on

the posterior wall. Pyloroplasty in such cases is done at a minimal risk and is justified when there are persistent symptoms with negative clinical findings. Even in the occasional case where exploration proves negative, the duodenum can be closed with negligible risk.

Duodenitis is a symptom complex which has only recently been recognized. It is an inflammatory lesion which gives dyspeptic symptoms suggestive of ulcer and may be the source of hemorrhage. The usual clinical investigative methods may fail to reveal the nature of this lesion. The roentgenologic study may be negative unless it is conducted by an expert. The inability to fill the duodenal bulb and the rapidity of emptying of the duodenum are suggestive evidence. At operation the findings consist of a slight edema, injection, and occasionally stipling of the anterior duodenal wall. Excision of this area as in pyloroplasty has been followed in a number of cases by complete relief of symptoms. Duodenitis may be the precursor of ulcer formation but until this has been definitely established the lesion should be excised when it is encountered at exploration.

When lesions of the posterior wall are encountered on opening the duodenum the treatment will vary, depending upon the location, fixation, acuteness, and edema of the ulcer. Lesions encountered in the first half inch and near either the superior or inferior border can be included in the incision which removes the anterior segment and pyloric sphincter without complicating the reconstruction of the pyloric outlet.

When the lesion is situated on the posterior wall, we formerly followed the custom inaugurated by Judd of destroying it with the actual cautery and approximating the mucous membrane over it. However, this procedure in two or three of our personal cases was followed by recurrence of symptoms and it has seemed wise to substitute either a Billroth-I operation under these circumstances or, after destruction of the ulcer, to close the pyloroplasty and complement it with a gastro-enterostomy.

Another satisfactory indication for employment of this type of pyloroplasty under certain circumstances is in ulcers which have perforated acutely. The controversy among surgeons over the institution of immediate gastro-enterostomy after closure of a perforated duodenal ulcer seems satisfactorily answered by saying that when closure of the ulcer is followed by stenosis of the pyloric lumen and the condition of the patient is such as to warrant it, immediate gastro-enterostomy is indicated. However, very frequently one may obviate this by putting a Jutte tube down through the pylorus and closing it over as suggested by Finney and doing the

gastro-enterostomy later if necessary. In a great many ulcers which are perforated explosively there is not a great deal of induration and cicatrization around the pylorus and consequently excision of the opening and the anterior half of the pyloric muscle may be satisfactorily carried out at the time and the closure made without encroachment on the lumen.

Donald has recently reported the treatment of acutely perforated duodenal ulcers by excision with pyloroplasty in which he includes a report of 14 cases with an operative mortality of 7 per cent. In his review of the literature Dowden is credited with being the first surgeon to employ this operation for acute perforation, in 1909. He claimed the double advantage of removing the ulcer and widening the lumen. Moynihan reported 22 cases treated in this manner with a 4.5 per cent mortality. Bager, of Stockholm, performed this operation in 78 cases with a mortality of 11.5 per cent, losing none of 45 cases operated upon within six hours after perforation. Where the acutely perforated ulcers are not associated with organic stenosis of the pylorus, pyloroplasty seems a distinctly advantageous procedure if it is technically possible to execute.

It has been estimated that from 2 to 6 per cent of gastro-enterostomized patients develop gastrojejunal or stomal ulcers. The treatment of this condition may prove a real problem since most of these cases are complicated by some degree of perforation. The transverse colon may be drawn into the inflammatory process and form a part of a large abscess, or it may be perforated with the formation of a fistula. This condition occurs in 10 per cent of the cases. Abscesses, on the other hand, may form in various parts of the upper abdomen between loops of small bowel and lead to intestinal obstruction, or may be attached to and perforating the anterior abdominal wall. In the absence of complications, treatment is directed first to the stomal ulcer. It may be excised and a new gastroenterostomy made, but patients who have been intolerant of a previous gastro-enterostomy are not likely to fare better after a second one. Gastric resection may be necessary but, since it gives primarily a higher mortality, the risk is even greater in these patients who are likely to be debilitated and who offer technically a more difficult problem. Frequently, after removing a jejunal ulcer and closing the openings in the stomach and jejunum one finds that the duodenal ulcer which was the initial cause of trouble has healed. With this particular set-up the duodenal ulcer can be excised and a pyloroplasty done, restoring the normal gastrointestinal continuity, which procedure affords the patient protection against recurrent ulcers.

The indications for pyloroplasty as just enumerated are several, as are the contraindications: 1. The operation should not be attempted where there are multiple lesions so situated that the technical difficulty is great or where by removal the lumen will be compromised to the point of giving rise to obstruction; 2. Pyloroplasty should not be done where there is a large posterior wall ulcer which is penetrating deeply into the pancreas and has become fixed; 3. When there is marked duodenal deformity or diffuse scarring with a narrowing and shortening of the first portion of the duodenum the operation should not be done; 4. With extensive involvement of the periduodenal tissues, the gallbladder or the liver, pyloroplasty should be avoided since attempts to mobilize the duodenum will likely result in perforation or reactivation of the lesion, either of which would nullify any benefits that might be expected from the operation; 5. When marked obstruction is present pyloroplasty is not the method of choice; and 6. Fat people with small stomachs offer at times insurmountable technical difficulties to direct attack.

In cases conforming to the criteria we have laid down, we have found that good results occur in approximately 90 per cent with protection against perforation, obstruction, and hemorrhage, in addition to relief from dyspeptic symptoms. The procedure is simple, can be executed by skilled surgeons with the lowest mortality of any surgical procedure on the stomach and duodenum. Where the indications can be met, it should be the operation of choice. In the few failures, the operation in no way interferes with the subsequent performance of other procedures for relief.

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MECHANICAL EMBARRASSMENT OF THE HEART

Galen recognized pericarditis in animals and suspected that it occurred in man. Then on down through the ages of treatment and mistreatment of acute pericarditis the human mind has wondered until the advent of the twentieth century.

Chevers (1842) described chronic constrictive pericarditis with an excellent understanding of the way in which it embarrassed the heart. Wilks (1870) and Kussmaul (1873) also preceded Pick (1896), whose name has been so commonly linked with the condition. About 1900 Delorme and Bauer suggested operative procedures to relieve the mechanical embarrassment of the heart caused by chronic pericarditis. It is interesting that these operations were devised by internists and carried out at their insistence by surgeons.

To appreciate the consequences of an adherent pericardium or mediastinopericarditis, it is necessary first to understand the relationship of the heart to the lungs and diaphragm during respiration. As Keith said, "The lungs in all their movements carry their pump with them." Normally not only the apex of the heart but also the roots of the lungs descend with the diaphragm during inspiration. The upper parts of the lungs, taking least advantage of the respiratory movements of the chest, profit most by the descent of the heart. If the heart is fixed by adhesions to the chest wall and diaphragm, during inspiration there is slight descent of the diaphragm, while its crura pull at the heart and, by way of the heart, at the roots of the lungs, posterior mediastinum and chest wall to cause serious interference with respiration.

While adhesions between the auricles and the pericardium cause only hypertrophy of the auricles, adhesions between the outer sur-

faces of the pericardium and the surrounding structures cause a regurgitation into the veins. In cases of adhesive pericarditis the caval opening in the diaphragm will be found greatly reduced in size, a compensatory mechanism to prevent regurgitation into the abdominal cava. According to other authors, of even greater importance is the mechanical obstruction by the adhesions of either the superior or inferior cava. Rohde has shown experimentally that three hours after the experimental narrowing of the inferior vena cava, the liver enlarges and ascites develops. However, it is generally considered that the most serious effect of constrictive pericarditis is that it interferes with the filling of the heart during diastole.

Pericardial adhesions may be divided into two groups: the external which attach the pericardium to outside structures surrounding the heart, and the internal which attach it to the heart.

Before contemplating an operation it is of course necessary to diagnose adherent pericarditis and to know the heart symptoms result from it, for often the thickened or partially adherent pericardium is causing no symptoms. It is a recent contribution that this condition does not necessarily produce enlargement of the heart. Perhaps the most important sign is fixation of the heart, best determined by x-ray. The roentgenologic aspects have been discussed in the new classic by Roesler. Electrocardiographic evidence is helpful in corroboration. Broadbent's sign is well known. Venous pressure is increased. The clinical aspects have been thoroughly described by White. Let us add that heart failure secondary to constrictive pericarditis is one of the very few types of heart failure in which digitalis is *not* indicated.

When the constricting pericardium actually prevents adequate filling of the ventricles during diastole, decortication is necessary. This procedure suggested by Delorme in 1895 was first performed by Rehn some years later. Since the myocardium has often been damaged by chronic inflammation, great care must be exercised in denuding it. It is important to free the left ventricle before decorticating the right: a two-stage operation is sometimes advisable. The thin-walled atriums should be left severely alone, though Churchill emphasizes that adhesions obstructing the ostium of either the superior or inferior vena cava must be released.

In the literature one finds reports of 50 patients that have been submitted to the Delorme operation. There have been 10 postoperative deaths. In 7 improvement was noted, and in 26 (six of these were done by Churchill) the results have been excellent and apparently permanent.

The Bauer operation of cardiolysis first performed by Petersen in 1902 removes that part of the bony cage immediately overlying the heart to relieve cardiac and respiratory embarrassment. This operation was not originally intended to sever adhesions and in the strict sense of the term was for secondary pericarditis in which there was less severe involvement of the musculature of the heart. Bauer considered resection of the parts of the third, fourth and fifth ribs covering the extent of cardiac pulsations would relieve the heart of embarrassment due to external adhesions.

Smith and Leggett in 1929 assembled 107 cases of this operation. They noted improvement following operation in 84 per cent. Mortality of the disease, which without operation was 100 per cent, was reduced to 29 per cent within one year. Almost one third of the patients returned to self-supporting occupations, while fully two thirds returned to limited activity. The etiologic factor was reported as rheumatic in 46 per cent, tuberculous in 29, pyogenic in 3 and uncertain in 22. Of the patients 28.8 per cent showed valvular disease and the presence of such lesions appeared to influence seriously the mortality of those who died during the first three months postoperative. Edema was present in 63 per cent of the cases.

A third phase of this subject considered by Graham includes those cases in which the heart has become so large it is mechanically embarrassed by its own bulk in the thoracic cage. Decompression in such cases, advised by Morison in 1907, was first performed by Stabb on a boy of 19. This boy had been treated with little success for aortic insufficiency and severe precordial pain for six years. Following the operation the pain disappeared, and the patient was so improved that he was able to support himself as a hat-maker. Graham also reports two cases with marked subjective and slight objective improvement after operation, though one patient died of heart disease and the other of pneumonia within a few months.

Surgery of the heart has been developed within the lifetime of most of us. What a challenge it offers!

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BOOK REVIEWS

OPERATIVE SURGERY. By J. SHELTON HORSLEY, M. D., LL. D., F. A. C. S., Attending Surgeon, St. Elizabeth's Hospital, Richmond, Va.; and ISAAC A. BIGGER, M. D., Professor of Surgery, Medical College of Virginia, Surgeon-in-Chief, Medical College of Virginia Hospitals, Richmond, Va. With Contributions by C. C. COLEMAN, M. D., F. A. C. S.; JOHN S. HORSLEY, JR., M. D.; AUSTIN I. DODSON, M. D., F. A. C. S.; and DONALD M. FAULKNER, M. D. In Two Volumes. Fourth Edition. 1,387 pages with 1,259 illustrations. Price, $15. St. Louis: The C. V. Mosby Company, 1937.

This is the fourth edition of Horsley's Operative Surgery, but is the first edition of a two-volume work by Horsley and Bigger covering the whole field of operative surgery with contributions by several authors. It is one of the most satisfactory medical textbooks which has come to our attention in a long time. Enlisted as collaborators with Dr. Horsley, in addition to Dr. Bigger, who has written the chapters on the neck, chest, hernia, sympathetic nervous system, and part of the operations upon the extremities, are: Claude C. Coleman, surgery of the central nervous system and the cranial nerves; A. I. Dodson, urology; John S. Horsley, Jr., plastic surgery; Donald M. Faulkner, orthopedic surgery; and Guy W. Horsley who gave much aid in the preparation of the chapter on proctology.

Horsley himself has contributed the chapters which he wrote in the previous editions, laying particular stress as before upon the preservation of physiologic function and the interpretation of the biologic processes which follow surgical operations. In the discussion of surgical drainage, malignant tumors, suturing blood vessels, and the vast subject of abdominal surgery he displays the hand of the master, both in his profound knowledge of the subject, and his ability to describe conditions and operative procedures in a clear and thorough manner. Although the two volumes are devoted primarily to operative surgery, necessarily considerable space is given to considerations of etiology, symptoms, and indications for operative interference.

Lucid descriptions of the latest operative procedures (which are changing constantly) employed in thoracic surgery are presented by Bigger. In no textbook have we observed a more thorough treatment of the important subject of plastic surgery than is contributed by John S. Horsley, Jr. The chapters by Coleman, Dodson and Faulkner on neurosurgery, urology and orthopedics are well done. As might be expected, however, the high spot in the whole work is the discussion of the surgery of the stomach and duodenum by the senior author, who ranks second to none as an authority on the subject.

A review of any of Dr. Horsley's books must always pay marked tribute to the vivid drawings of Miss Helen Lorraine. To be complete no medical textbook demands as many and as clear illustrations as does a work on operative surgery. Certainly these volumes fulfill such a requirement to a superlative degree, and the authors, artist and publishers are to be congratulated upon achieving such conspicuous success. It is pleasing to have drawings so uniform in design, a result which can be obtained only by having them all made by the same artist. Their freshness is an indication that the work contains no obsolete matter. Few, if any, books of this kind have been so profusely illus-

trated. Among the 1,350 pages are found 1,259 pictures, almost one for every page. Every surgeon and every medical library should possess these volumes.   FRANK K. BOLAND, M. D.

HEART DISEASE. By PAUL DUDLEY WHITE, M. D., Lecturer in Medicine, Harvard Medical School; Physician to the Massachusetts General Hospital, Boston. New Second Edition. 744 pages with 125 illustrations. Price, $7.50. New York: The Macmillan Company, 1937.

A surgeon of a former day was interested in the heart because he wanted to know whether it was good enough to carry his patient through a contemplated operation. The surgeon of today takes a much more lively interest in this all-important organ because he recognizes not only that he can sometimes prevent the development of cardiac disease but also because the heart itself has during this century come within the surgical domain. Indeed this journal has run a series of editorials on the heart in surgery. It is therefore unnecessary to apologize for bringing to our readers' attention the second edition of Paul White's classic.

The new book has of course been brought up to date, and there have been many advances in cardiology in the last six years, but it also is improved by condensation. Dr. White's polished style, distinguished for its clarity, makes the book good reading too. The illustrations though not very numerous are well chosen. A physician can find within its covers almost anything he wishes to know about the heart and its ailments and his time will be well occupied in studying all of it.

CLINICAL ROENTGENOLOGY OF THE CARDIOVASCULAR SYSTEM: Anatomy, Physiology, Pathology, Experiments and Clinical Applications. By HUGO ROESLER, M. D., Associate Professor of Roentgenology and Cardiologist, Department of Medicine, Temple University School of Medicine; Cardiologist, Temple University Hospital; Consulting Cardiologist, Shriner's Hospital for Crippled Children, Philadelphia, Pennsylvania. 343 pages with 199 illustrations. Price, $7.50. Springfield and Baltimore: Charles C Thomas, 1937.

Within the confines of this book Roesler has included a fundamental discussion of the anatomy and physiology of the heart and great vessels and a discussion of the roentgenologic detection of abnormalities that is unequalled. The result is a monograph which the roentgenologist and the cardiologist must have and if the surgeon does not care to study it himself, he should be sure that his consultants have done so. The author himself has contributed a great deal to the roentgenology in this field. The book is particularly valuable on account of the extensive bibliography which includes a great many papers from foreign literature that are not readily available outside of the large centers. The book is beautifully illustrated with almost 200 pictures.

Roesler has achieved a masterpiece.

INHALATION ANESTHESIA. *A Fundamental Guide*. By ARTHUR E. GUEDEL, M. D., Associate Clinical Professor of Surgery (Anesthesia), University of

Southern California School of Medicine. 172 pages. Price, $2.50. New York: The Macmillan Company, 1937.

Rare is the physician who is called upon to give inhalation anesthetic who will not be able to do it better for the study of this book. It should prove invaluable to interns who still give so many. Not only is the book thorough and fundamental, but short case reports serve to lighten it and to drive home the important points. Though the major part is devoted to ether, which still is the most widely used anesthetic agent, the dangers of chloroform are discussed and the various gases are considered in sufficient detail. The book is recommended without reservation to those who are beginners in anesthesia and careful study of it should save many lives.

BRIGHT'S DISEASE AND ARTERIAL HYPERTENSION. By WILLARD J. STONE, B. Sc., M. D., F. A. C. P., Clinical Professor of Medicine, University of Southern California, Los Angeles; Attending Physician to the Pasadena Hospital, Pasadena. 352 pages with 31 illustrations. Price, $5. Philadelphia and London: W. B. Saunders Company, 1936.

To write an ideal medical book, the physician should be thoroughly familiar with the important literature on the subject, including historical papers. He should have had extensive experience so that he is in a position to evaluate from his personal knowledge conflicting ideas and theories that have been advanced as well as to present some original cases from his own practice. He should have a clarity of style leavened with an occasional bit of humor, and he should be willing to condense to the utmost. He should also have a publisher who will grant him a sufficient number of illustrations and who will advise him in the selection and reproduction of them.

Dr. Stone has turned out a book on Bright's disease and arterial hypertension which so closely approximates the ideal that the difference is not visible to the human eyes of this reviewer.

THE DISEASES CF INFANTS AND CHILDREN. By J. P. CRCZER GRIFFITH, M. D., PH. D., Emeritus Professor of Pediatrics in the University of Pennsylvania; Consulting Physician to the Children's Hospital, Philadelphia; Consulting Physician to St. Christopher's Hospital for Children; Consulting Pediatrist to the Woman's, the Jewish, and the Misericordia Hospitals, etc.; Corresponding Member of the Société de Pédiatrie de Paris; and A. GRAEME MITCHELL, M. D., B. K. Rachford Professor of Pediatrics, College of Medicine, University of Cincinnati; Medical Director and Chief of Staff of the Children's Hospital of Cincinnati; Director of the Children's Hospital Research Foundation; Director of Pediatric and Contagious Services in the Cincinnati General Hospital. Second Edition. 1,153 pages with 293 illustrations. Price, $10. Philadelphia and London: W. B. Saunders Company, 1937.

When a book of this size requires a second edition within four years it is sufficient proof of its excellence. The pediatrician will find it complete and up to the minute. The general practitioner will appreciate its clarity, freedom from bunk, and common sense.

DISEASES OF THE CORONARY ARTERIES AND CARDIAC PAIN. Edited by ROBERT L. LEVY, M. D., Professor of Clinical Medicine, College of Physicians

and Surgeons, Columbia University; Associate Visiting Physician and Cardiologist, Presbyterian Hospital, New York City. 445 pages with 97 illustrations. Price, $6. New York: The Macmillan Company, 1936.

This superb book with chapters by some of the leading men in this country is brought to the attention of the SURGEON's readers partly because of the surgeon's susceptibility to coronary disease, partly because of the last three chapters on surgery for the relief of cardiac pain. These take up of course neurosurgery, total thyroidectomy and Beck's new operation of grafting a pectoral muscle to the myocardium.

THE FUNDAMENTALS OF ELECTROCARDIOGRAPHIC INTERPRETATION. By J. BAILEY CARTER, M. D., Clinical Instructor, Department of Medicine, Rush Medical College, the University of Chicago; Associate Staff, Cook County Hospital, Augustana Hospital, Chicago. With a Foreword by HORATIO BURT WILLIAMS, M. D., Dalton Professor of Physiology, College of Physicians and Surgeons, Columbia University, New York. 326 pages with 250 illustrations. Price, $4.50. Springfield and Baltimore: Charles C Thomas, 1937.

This book represents the amplification of a series of papers contributed by the author to the JOURNAL OF AMERICAN MEDICAL ASSOCIATION a year or two ago. It has been improved by the suggestions of many men who wrote to him while the series was being published. It may therefore be termed a standard work representing the accepted opinion of today in this field.

ESSENTIALS OF ELECTROCARDICGRAPHY, *for the Student and Practitioner of Medicine.* By RICHARD ASHMAN, PH. D., Professor of Physiology, the Louisiana State University Medical Center; and Director of the Heart Station, Charity Hospital of Louisiana, at New Orleans; and EDGAR HULL, M. D., Assistant Professor of Medicine, the Louisiana State University; and Visiting Physician, Charity Hospital of Louisiana, at New Orleans. 212 pages with 100 illustrations. Price, $3.50. New York: The Macmillan Company, 1937.

This very creditable book from L. S. U., though sound, represents a more individualistic point of view, being based largely on experiences at the Charity Hospital. Their statistics are interesting. The type is unusually good and the illustrations are clear. The book is recommended.

The following books are also acknowledged:

LABORATORY OUTLINE IN FILTERABLE VIRUSES. By ROSCOE R. HYDE, Professor of Immunology and Director of the Laboratories of Immunology and Filterable Viruses, School of Hygiene and Public Health, The Johns Hopkins University. With the assistance of RAYMOND E. GARDNER, Associate in Immunology. 85 pages. Price, $1.50. New York: The Macmillan Company, 1937.

THE COLON AS A HEALTH REGULATOR—*From a Surgeon's Point of View.* The effects and treatments of its developmental abnormalities. By SIR HENRY M. W. GRAY, K. B. E., C. B., C. M. G., LL. D. (Aberdeen), M B., C. M. (Aberdeen), F. R. C. S. (Edinburgh), Colonel, A. M. S.

(retd.), late Consultant Surgeon, B. E. F., France, and Consultant in Special Military Surgery (orthopædic), Home Service; Civil Surgeon, S. African War, 1899-90; formerly Surgeon and Lecturer on Clinical Surgery, Aberdeen Royal Infirmary and Royal Hospital for Sick Children, Aberdeen; Surgeon in Montreal. 100 pages with 31 illustrations. Price, $2.50. Toronto: The Macmillan Company of Canada Limited, at St. Martin's House, 1936.

PHYSICAL DIAGNOSIS. By RALPH H. MAJOR, M. D., Professor of Medicine in the University of Kansas. 457 pages with 427 illustrations. Price, $5. Philadelphia and London: W. B. Saunders Company, 1937.

TREATMENT IN PSYCHIATRY. By OSKAR DIETHELM, M. D., Professor of Psychiatry, Cornell University Medical College, New York; Psychiatrist-in-Chief, New York Hospital (Payne Whitney Psychiatric Clinic); formerly Associate Professor of Psychiatry, The Johns Hopkins University; Assistant Psychiatrist, The Johns Hopkins Hospital, Baltimore. 476 pages. Price, $4. New York: The Macmillan Company, 1936.

To the surgeon who treats these conditions these books are highly recommended.

THE CHARLOTTE ASSEMBLY

The flood that inundated Louisville in January bore down severely on the physicians of that city. With gallant courage worthy of the traditions of Kentucky, however, they would not give up the idea of The Southeastern Surgical Congress holding its Eighth Annual Assembly there until less than three weeks before it was due to convene. Then Dr. Abell, after conferring with Dr. Rankin, telephoned Director-General Beasley in Atlanta that Louisville was "forced to ask for a raincheck on the Assembly": although the physical condition of the city would make it possible for the Congress to meet there, every local physician had been and was being so overworked that it would be impossible for them to do for the visitors what they wanted and therefore, in order that the Congress might enjoy real Kentucky hospitality, it was best to postpone the Assembly in Louisville until 1938.

Almost before the telephone wires had grown cold, Charlotte, Asheville, Chattanooga, Birmingham and Atlanta extended invitations for the 1937 convention. Since North Carolina had never entertained the Congress before, the choice narrowed down to Charlotte and Asheville, and Charlotte won out.

Dr. Roy B. McKnight was appointed General Chairman of the local committees. Other chairmen were Dr. Stephen W. Davis, Auditorium and Exhibits; Dr. Wm. Marvin Scruggs, Clinics; Dr. Robert W. McKay, Entertainment; Dr. Addison G. Brenizer, Hotels; Dr. V. K. Hart, Publicity, and Dr. Wm. Francis Martin, Transportation. The way these men and their cohorts went to work was astonishing. They ran the thing like old masters and any doctor within a radius of 500 miles of Charlotte who did not know of the meeting must not only have lacked a radio but have been deaf, dumb and blind—particularly dumb. The attendance, considering that the last minute change left little time for planning to be away from home and that there were no medical students to swell the registration, was extraordinary. More than 500 surgeons, representing the ten States of the Congress and eight others, including Massachusetts and Minnesota, were in attendance. The only disappointing feature about the whole meeting was the small delegation from Virginia.

The Assembly was opened promptly at 9 the morning of Monday, March 8, by the President, Dr. John Darrington. The Rev. R. L. Ownbey, of Charlotte, pronounced the invocation. Dr. McKnight welcomed the Congress on behalf of the Mecklenberg County Medical Society, the City of Charlotte and the State of North Carolina.

Dr. Irvin Abell was shifted to first place in order to permit him to take the noon train back to Louisville. The flood had prevented his finishing his paper on pancreatitis, so he spoke on "The Acute Abdomen." Dr. Glen Spurling succeeded Dr. Abell in order to take the same train home. Dr. Hertzler, who had been recovering from influenza, had suffered a relapse and was unable

to be present. This was a great disappointment to his friends of the South-
eastern who had come to consider him an integral part of the Assembly. Dr.
J. W. D. Dicks felt himself unable to leave the flood-sufferers in Natchez,
and Dr. George Semken of New York was also unable to be present.

Dr. R. L. Sanders, of Memphis, serving as a pinch-hitter, described a trans-
verse incision for operations on the upper abdomen. Charlotte supplied the
two other substitutes, Dr. Oren Moore, who discussed congenital anomalies
of the female genital tract, and Dr. Elias S. Faison, who presented a case of
hyperparathyroidism.

Following the Monday afternoon session, a business meeting of all the
Fellows of the Congress was held. At this time Dr. T. C. Davison, of Atlanta,
was made President-Elect and Dr. Julian Rawls, of Norfolk, Vice President.
As usual, Dr. B. T. Beasley, of Atlanta, was re-elected Secretary-Treasurer.

Monday evening was devoted to a Memorial Service in honor of the Fellows
of the Congress who had died since the last Assembly and to the C. Jeff Miller
Lectureship. In addition to Dr. Miller, Dr. G. J. Hauer, of New Orleans,
and Dr. E. B. Bailey, of Wichita Falls, were commemorated.

The C. Jeff Miller Memorial Lecture was delivered by his lifelong friend,
Dr. W. D. Haggard. The scientific part of this paper was appropriately
devoted to a gynecologic subject, uterine fibroids. Dr. Charles Gordon Heyd,
Dr. J. H. J. Upham, Dr. Mims Gage, Dr. Fred W. Rankin and Dr. Fred-
erick A. Besley paid brief tribute to Dr. Miller's memory, and Dr. Frank K.
Boland dedicated his oration, "The South's Contribution to Gynecology,"
to Dr. Miller too.

Dr. Edward D. Churchill, of the Massachusetts General Hospital, held
the first clinic. The case was one of bronchiectasis under bronchoscopic treat-
ment by Dr. V. K. Hart.

Dr. Oswald S. Lowsley, of New York, devoted the time allotted to his
clinic to a discussion of an operation he has devised for the relief of impotency.
This operation (shortening of the penile ligament and of the ischiocavernosus
and bulbocavernosus muscles) gives good results in carefully selected cases.
The selection excludes absolutely the psychoneurotic and the aged; the opera-
tion is particularly applicable to younger men in good health who have sus-
tained an injury to the perineum.

The Round Table discussions were among the stimulating daily features
of the Assembly, providing an opportunity for questions about the papers pre-
sented. These luncheons were unusually well attended, and even on the last
day more than sixty men were present. This was because, on account of
train schedules, Wednesday's sessions were telescoped and the formal meeting
adjourned about 3 p. m. with a good attendance till the very end.

The various papers read before the Assembly will be published in these
pages: they need no comment now.

Mrs. V. K. Hart and Mmes. Andrew Blair, Addison G. Brenizer, Stephen W. Davis, J. A. Elliott, Hamilton McKay, Roy B. McKnight, Wm. F. Martin, Alonzo Myers, Wm. Marvin Scruggs and T. P. White graciously entertained the wives of the visitors at the Country Club and in their own homes. Dr. Brenizer had a dinner at his home for the speakers and the officers of the Congress Monday evening. Before the Banquet Tuesday evening each doctor who had registered was invited to one of a number of small parties. The Banquet was held at the Hotel Charlotte Tuesday evening. The most expert toastmaster in the world, Dr. Haggard, presided. The speakers all remembered that brevity was an integral ingredient of a good after-dinner speech, so their wit did not delay the informal dance.

The Eighth Annual Assembly of The Southeastern Surgical Congress was a great success. The American Medical Association was represented by its President and President-Elect; the American College of Surgeons by its President-Elect and the Chairman of its Board of Regents; the American Proctologic Association by its President; the Southern Surgical Association by its President; the Southern Medical Association by its President; the Florida State Association by its President-Elect, and in addition, ex-Presidents of several of these organizations were present.